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THESIS

**REENGINEERING THE
CHINA LAKE
NAVAL AIR WARFARE CENTER
WEAPONS DIVISION
SMALL PURCHASE
PROCUREMENT PROCESS**

by

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June 1995

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REENGINEERING THE CHINA LAKE NAVAL AIR WARFARE CENTER WEAPONS DIVISION SMALL PURCHASE PROCUREMENT PROCESS

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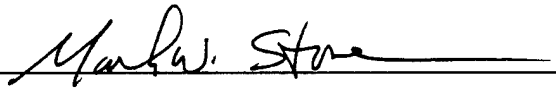
Approved by: 
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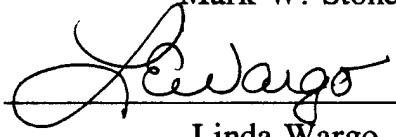
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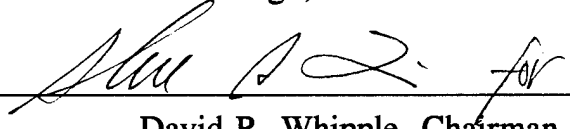
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ABSTRACT

This thesis classifies the current processes and procedures of the China Lake Naval Air Warfare Center Weapons Division's (NAWCWPNS) small purchase system, identifies inefficiencies in the process and shows where Business Process Reengineering (BPR) methodology can be utilized. A background in acquisition reform and Business Process Reengineering is provided. Additionally, this thesis conducts an analysis of the small purchase process and provides recommendations for improvement. If implemented, the recommendations will lead to improved efficiency and service to the small purchase customer.

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I. INTRODUCTION

A. GENERAL

The Department of Defense is in a rapidly changing environment. Funding is being cut back every year and public concern over the Federal budget and national debt is increasing. In order to maintain a strong military readiness, and remain competitive with fewer resources, the Federal Government procurement process must change. The "business as usual" mentality is not acceptable. (Murphy, 1995, p.1)

Reforms of the past decade were implemented to ensure the proper expenditure of public funds and to streamline the procurement process. Most recently the Federal Acquisition Streamlining Act (FASA) of 1994 was passed. This is the first major change in procurement policy in quite some time. The FASA implemented massive changes in the Federal Government procurement process. In order to maintain a minimal readiness level, efficiency must be increased. The infrastructure needed to implement radical changes was established with the passing of FASA. FASA instituted electronic commerce as the way in which the Federal Government does business. This electronic emphasis can be a major factor in dramatic improvements in Government reengineering efforts.

Reengineering is a buzz word that has been around for several years. It started in the information technology field as a method used to make radical improvements. Business Process Reengineering (BPR) is the offshoot of this for work processes. Reengineering efforts can result in dramatic improvements in processes by focusing on what should be rather than what is. Improvements have been the goal of much of the acquisition reform legislation that has been passed by the Congress. Most recently the Section 800 Report, and the National Performance Review have attempted to improve the Government procurement process. They all have one thing in common: Getting more for

the diminishing dollar and being more efficient. The need for improved efficiency has prompted the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in the acquisition process. BPR is an alternate reform initiative which embodies these concepts.

This thesis reviews the current small purchase acquisition process/procedures utilized by the China Lake Naval Air Warfare Center Weapons Division (NAWCWPNS) and identifies areas where possible improvements can be made. It determines if the process of Business Process Reengineering can be applied to achieve the appropriate reforms in an era of inevitable financial resource reduction. The small purchase procurement process at NAWCWPNS was evaluated to ascertain its effectiveness in satisfying customer needs. Processes or rules that exist but provide no value are recommended for removal or change.

B. AREA OF RESEARCH

In this thesis, the current small purchase acquisition processes at NAWCWPNS are investigated. Additionally, the effects of the Federal Acquisition Streamlining Act (FASA) on the small purchase operation are evaluated. The objective was to identify areas where reengineering is appropriate in redesigning the acquisition process. NAWCWPNS has a Small Procurement Electronic Data Interchange (SPEDI) program that was directly affected by the passage of FASA. With the increased emphasis on electronic information under FASA, it was possible to reexamine the work flow of the entire acquisition process at NAWCWPNS for reengineering.

C. RESEARCH QUESTIONS

The thesis is modeled around a primary research question and six subsidiary research questions, as stated below:

1. Primary Research Question

- What processes and procedures are involved in the current small purchase acquisition system of NAWCWPNS and to what extent can applications of Systems Reengineering be applied in an effort to maximize effectiveness?

2. Subsidiary Research Questions

- What are the current process and procedures involved in the small purchase acquisition at NAWCWPNS?
- What reform has been enacted regarding small purchase acquisition that impacts NAWCWPNS?
- What affect does the Federal Acquisition Streamlining Act have on the small purchase acquisition processes?
- What is reengineering and what are the overall implications?
- What can be reengineered in NAWCWPNS's small purchase process?
- If implemented, can reengineering improve the effectiveness and efficiency of the NAWCWPNS small purchase acquisition process?

D. SCOPE

This thesis analyzes the current small purchase acquisition process/procedures of NAWCWPNS. Additionally, it defines Business Process Reengineering and compares it to recent Total Quality Leadership initiatives to ascertain the viability of applying this process as an alternative to design a more efficient cost effective method or process for acquisition as it relates to NAWCWPNS.

E. METHODOLOGY

This thesis utilizes historical data to provide the foundation and background of the acquisition process as well as major reforms which have

occurred in the past which directly affected NAWCWPNS. In addition to reviewing currently available acquisition, Reengineering, and Total Quality Leadership literature, sources such as the Defense Logistics Studies Information Exchange (DLSIE) and the resources of the National Contract Management Association (NCMA) were utilized.

Current Department of Defense (DoD) acquisition instructions, directives, and regulations as well as NAWCWPNS internal guidance were reviewed. Personal interviews with key purchasing personnel at NAWCWPNS revealed how policy is being implemented, how the process actually is being performed, and the practicability of utilizing reengineering techniques to optimize projected resources.

F. ORGANIZATION OF THE STUDY

Chapter II of this thesis provides an introduction and background on acquisition reform and Business Process Reengineering (BPR). It includes a discussion of acquisition reform initiatives and why BPR is needed in today's operating environment.

Chapter III is a description of the current small purchase process. It is includes a flow chart depicting the current process. The data in this chapter are utilized in subsequent chapters for analysis and recommendations.

Chapter IV provides an analysis of the current process. This includes all three of NAWCWPNS' current small purchase methods (Bankcard, SPEDI, traditional small purchase).

Chapter V provides recommendations to improve the current process. The recommended changes focus on improving the process from the customers perspective. This includes process improvements, organizational improvements, and purchasing system changes. A simplified flow chart is also provided.

G. BENEFITS OF THE STUDY

This thesis provides an analysis of the processes and procedures at the China Lake Naval Air Warfare Center Weapons Division's (NAWCWPNS) small purchase process and shows where Business Process Reengineering (BPR) methodology can be utilized. Additionally, this thesis provides recommended improvements for NAWCWPNS' small purchase system. BPR methodology allows dramatic improvements when utilized as an improvement tool. Implementing the recommended changes will allow NAWCWPNS to significantly improve customer service.

II. BACKGROUND AND THEORETICAL FRAMEWORK

A. INTRODUCTION

Government and commercial businesses have been operating in much the same manner for over a century. The advent of the production line was the last major breakthrough in production technology. With the production line mentality, processes are broken down into steps and each step is done in sequence. Each worker becomes a specialist that can only deal with the one or at most, a few tasks. This is the case for most business processes. This method works fine in an era of expanding demand where the customer is satisfied to be able to get any product that fulfills a need. (Hammer, 1993, p.12)

In this, the information age, change is happening rapidly and it is difficult to get a satisfactory product to the customer in a timely fashion. The times when a customer is satisfied just to receive a product are long past. Now customers want the best available products or services in a short period of time. To meet the customer's desires, an organization must be able to make significant improvements in service. Incremental change is the continual improvement in the way business processes are performed. However, the small rate of incremental change cannot keep up with the rapid transformation of the Government procurement process. Along with rapid change, today's customer is unique in their desires. The ability to deliver what each customer wants in a timely fashion is critical. That is where Business Process Engineering (BPR) comes in. BPR is:

> The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed (Hammer, 1993, p.32).

This definition is applicable to all organizations, including the Federal Government. The four key words to success in this definition are process, fundamental, radical, and dramatic. (Hammer, 1993, p.32)

The fundamental rethinking is a key to success in that the institution implementing BPR must get back to the very basic question not of how do we do things, but why? Why do we do things? Why do we do it our particular way? BPR gets back to the basics and builds from that. No business operation should be taken for granted as needed. The focus is on what should be done from the aspect of what benefits the customer.

Incremental change methods such as Total Quality Management (TQM) are not viable improvement techniques where BPR is needed. TQM looks at how a process is being performed and improves from there. The end process looks very similar to the original one. With BPR's analysis of the fundamental question of Why?, the end process may not resemble what was started with. (Manganelli, 1994, p.18)

The word radical may surprise some people. It is key since BPR is not about making refinements or adjustments. When implementing BPR, the radical change comes from looking at how work should be accomplished. The way work is accomplished now is not relevant. (Hammer, 1993, p.33)

The key word process is the most important aspect of BPR. A process is a series of interrelated activities that convert business inputs into business outputs by changing the state of relevant business entities (Manganelli, 1994, p.17). The inputs are processed into an output that is of value to the customer. Past business activities have focused on tasks. A process was broken down into individual tasks that individuals could easily master. The solution is to change the focus from tasks back to the entire process. (Hammer, 1993, p.35)

The final key to BPR is dramatic change. This is what differentiates BPR from other incremental improvement programs. Reengineering is looking for

impressive improvements. To achieve improvements of this magnitude, it is necessary to start from the beginning. (Hammer, 1993, p.33)

B. ACQUISITION REFORM

Major reform initiatives that directly affect the procurement process include the Federal Acquisition Regulation (FAR), the Competition in Contracting Act (CICA), the Small Business/Small Disadvantaged Business, the Buy American, and Prompt Payment Acts. The Federal Acquisition Streamlining Act is discussed in the next section.

The FAR was published on April 1, 1984. It is a regulation designed to prescribe, structure and control the methods and procedures by which business is conducted within the Federal Government. The objective of the FAR was to overcome the inconsistencies created by the various Federal organizations and agencies in applying their policies and procedures to the procurement process.

CICA reversed longstanding public policy concerning the administrative procedures associated with the solicitation and award of public contracts by the U.S. Government. CICA significantly overhauled the procurement process and requires that Government agencies promote and use full and open competition. The goal is to identify as many qualified sources as possible to get the best value for the Government. (Sherman, 1991, p.117)

The Small Business Act was introduced in 1953. Many amendments to it have had a significant affect on procurement processes. The initial intent of the Act was to assist small businesses in securing a fair share of Government contracts. Under the Small Business Act contracting officers are directed to set aside any procurement valued at 25 thousand dollars or less unless there is no reasonable chance of obtaining quotations from two or more responsible small businesses. (Sherman, 1991, p.357)

The Buy American Act's objective is to sustain or create jobs and promote domestic economic development. Initially established in 1933, its

wording was vague and subject to interpretation. The wording was clarified in 1954 when uniform procedures were established for executive agencies in evaluating foreign bids. A product must be an unmanufactured end product mined or produced in the U.S., or an end product manufactured in the U.S. to be considered domestic. (Sherman, 1991, p.331)

In May of 1982, the Prompt Payment Act was enacted. The Act requires that the Government pay its bill in a timely manner and establishes increased liability in the form of interest on the principal if not paid within 30 days of receipt of proper documentation attesting the receipt and acceptance of goods or services. (Sherman, 1991, p.218)

C. FEDERAL ACQUISITION STREAMLINING ACT OF 1994

The Federal Acquisition Streamlining Act (FASA) of 1994 sets the groundwork for fundamental change in Federal contracting. The FASA enables this change by removing or substantially changing 225 statutes, resulting in the removal of tight controls and strict codes. The new concepts that embody FASA also help. Among these are:

- Moving towards commercial contracting methods as much as possible.
- Putting the Government's procurement process on an electronic basis, to the greatest extent possible.
- Eliminating paperwork burden whenever practicable.
- Streamlining the contracting function by eliminating non-value-added requirements. (Lumer, 1994, p.i)

These themes are central to the Business Process Reengineering effort. In order to begin a reengineering project, the environment must be conducive to the radical changes that are required.

FASA's overall theme is to streamline the Government procurement process. Several sections of the FASA have direct impact on small purchase acquisitions. The first is the Simplified Acquisition Threshold. The Act raises the small purchase threshold to $100,000 and redesignates it as the "Simplified Acquisition Threshold". This is a major change which has the potential to increase productivity, and decrease paperwork and procurement lead time. The threshold is only raised to $50,000 until the contracting activity develops electronic contracting capabilities under the Federal Acquisition Computer Network (FACNET). The FACNET is discussed in the next section. This simplified acquisition threshold has a direct impact on the China Lake small purchase operation since larger contracts which have not been classified as small purchases now can be. The greatest impact and cost savings will be realized when NAWCWPNS becomes FACNET certified.

The section of FASA under Small Business Reservation sets the reservation level between $2,500 and $100,000. This is an elimination of reservations up to $2,500. This allows NAWCWPNS to increase the use of credit card purchases and has the potential to increase competition with the inclusion of other businesses. (Lumer, 1994, p.64)

The Federal Acquisition Regulation (FAR) is now required to list the laws that are inapplicable to simplified acquisitions. FASA now exempts simplified acquisitions from a list of laws yet to be determined. This will have a major impact on streamlining purchases made under simplified procedures by removing some of the burdens required for small purchases. The FAR Council determines the applicability of laws. (Lumer, 1994, p.66)

The Act authorizes simplified acquisitions for procurements under $50,000 immediately, and as an incentive to further electronic commerce, $100,000 when a procuring agency becomes FACNET certified. As a minimum, this doubles the current small purchase threshold of $25,000. The law also states that purchases cannot be divided to reach the threshold, and

that competition is to be promoted to the maximum extent practicable. (Lumer, 1994, p.68)

Another procedure enacted by FASA which is dependent on FACNET certification is the publication requirement in the Commerce Business Daily (CBD). If the activity is not certified the requirement is for procurements over $25,000. Another incentive to become FACNET certified is the increase of the notification threshold to $100,000 for certified agencies. Although competition must still be promoted under the threshold, no longer having to synopsize procurements under $25,000 in the CBD will shorten procurement lead times significantly. Solicitations between $25,000 and $100,000 need only to be open for 15 days. (Lumer, 1994, p.69)

FASA establishes a new requisition category for purchases up to $2,500. Acquisitions below this micro-purchase threshold need not be reserved for small businesses, and may be made without obtaining competitive quotations if the contracting officer determines that the price is reasonable. The Buy American Act does not apply to micro-purchases. The fact that the Buy American Act does not apply to micro-purchases may be the number one area where improvement in customer service can be achieved. This one change allows NAWCWPNS to maximize the use of their credit card purchases, eliminate considerable paperwork, and speed up their procurement process significantly. One potential method to improve customer service is allowing non-procurement personnel to make micro-purchases without becoming procurement officials. (Lumer, 1994, p.71)

One of the essential elements of FASA is the use of information technology. Conducting procurement on an electronic basis and eliminating as much paperwork as possible can result in a significantly improved process. One key element of electronic commerce is the FACNET. (Lumer, 1994, p.107)

D. FEDERAL ACQUISITION COMPUTER NETWORK

FASA requires the Federal Acquisition Computer Network (FACNET) architecture to be implemented by January 1, 2000. FACNET is to be Government-wide and allow interoperability among users. It is a Federal computer network of procurement databases which will provide a means for the Government to conduct electronic commerce with its trading partners. The FACNET will allow executive agencies to do the following electronically:

- Provide widespread public notice of solicitations for contract opportunities issued by an executive agency.
- Receive responses to solicitations and associated requests for information through such system.
- Provide public notice of contract awards (including price) through such system.
- In cases in which it is practicable, receive questions regarding solicitations through such system.
- In cases in which it is practicable, issue orders to be made through such system.
- In cases in which it is practicable, make payments to contractors by bank card, electronic funds transfer, or other automated methods.
- Archive data relating to each procurement action made using such system. (U.S. Congress, Title IX Sec. 30)

FACNET allows the electronic interchange of procurement information between the private sector and the Federal Government, and among Federal agencies. This ability is a major enabler to achieve dramatic improvements in the procurement process.

Access to the FACNET is going to be a key factor in the success of this program. Potential Government suppliers can gain access to FACNET in two ways. They can utilize a Government-owned computer allowing a direct

connection to the network or they can use a private computer and the services of a Value-Added Network to make the connection.

A Value-Added Network (VAN) is a communications network that transmits, receives, and stores Electronic Data Interchange (EDI) documents between different organizations (customers and suppliers). VANs are typically operated by third party vendors who lease telecommunication lines from common carriers. These companies are called value-added carriers. Value-Added Networks add "value" to their leased communications lines by using communication hardware and software and their expertise to provide packet switching and other communication services (O'Brien, 1993, p.270). These packets, or groups of data occupy the VAN line only long enough to transmit the data.

E. INCREMENTAL CHANGE METHODS

There are numerous methodologies available for improving processes. Among these are Total Quality Management (TQM), Rightsizing, Restructuring, and Automation. TQM is probably the most recognized of these programs. It is focused on change (Walton, 1990, p.16). Old management systems are founded in a scientific, rigid system. Because of this, it is very difficult to get people to try new methods (Manganelli, 1994, p.18).

Another central concept to improvement is to ensure the methods employed are for that particular situation. It is tempting to try and emulate what others have done, particularly if it has been very successful. What works for one company may not work for another. A prime example of this is how the large corporations in the U.S. latched onto Japanese quality circles in the 1980's. American executives did not understand that in Japan, quality circles were integrated into a different management style. Because of this quality circles became just another management program that was poorly planned and executed (Walton, 1990, p.16).

Once the environment for change is set, one strives for continuous, incremental improvement. One of W. Edward Deming's fourteen points is to improve constantly and forever the system of production and service. Improvement is not a one-time effort. Management is obligated to continually look for ways to reduce waste and improve quality (Walton, 1990, p.18). Deming's philosophy is based on a Plan-Do-Check-Act cycle. A company plans a change, does it, checks the results and, depending on the results, acts either to standardize the change or to begin the cycle of improvement again with new information.

Process reengineering is compatible with incremental methods. If dramatic change is needed to bring a process up to speed, then BPR is needed. However, if a process is not very far out of line, or in a less dramatic changing environment, then an incremental approach will work. It is also beneficial to use continuous improvement in between major process reengineering phases to help keep systems current. (Manganelli, 1994, p.19)

F. BUSINESS PROCESS REENGINEERING

Although Business Process Reengineering (BPR) shares many of the same qualities as incremental methods, it is fundamentally different. BPR and other quality movements share many common themes. Both are very process-oriented, and acknowledge the importance of the process. The starting point for both methods is the customer. One starts with the customer and works backwards from there. There is a great emphasis on the need to implement change, not to copy others, and to strive for quality, value added processes.

However, most quality programs work within the framework of a company's existing process and strive to improve it with a continuous, incremental effort. Reengineering is about radical change. While other programs may smoothly and evenly improve performance, BPR is looking for ways to have a dramatic improvement. Alone, continuous improvement will fail

if it is applied to a business world where change is no longer continuous (Manganelli, 1994, p.18). When change is dramatic, then improvement must also be dramatic.

Business Process Reengineering is not about starting over. The concept involves starting with a clean canvas but with the view of the old processes. Prior practices and assumptions are set aside so that the ideal process can be revealed. The new process structure may look similar to the old process, or it may be totally different.

There is no simple answer to what a reengineered process should look like. It should not look like the old process. If a process is simply automated, you are left with the same problems that were there in the beginning. The process may or may not be somewhat faster. In an article in the Government Executive on Federal attempts at Business Process Reengineering, it was stated that despite huge investments in information technology, agencies' productivity growth has been sluggish (Corbin, 1992, p.41). The flaw in just incorporating automation is that it cannot overcome the lack of good management and organization.

The objective should be to transform a process that may be fragmented and specialized into a process that is compressed and integrated. Easy access to computers and the potential they contain removes the need to have employees who are specialists. When knowledge is required, it may be provided with a Decision Support System or an Expert System. These computer based information systems provide consultation services to the user. (Corbin, 1992, p.41)

Reengineering should replace sequential processes with parallel process structures wherever possible. A paper-driven process is typically done sequentially since only one person may work on the documents at once. A paper-driven process can result in excess time spent en route to the next processor. This transportation and/or waiting time causes unnecessary delays.

Computer databases allow data, graphics, and images to be accessed by many people simultaneously. This allows steps to be done in parallel, streamlining the total process time. (Manganelli, 1994, p.87)

Processes should be kept simple. This enables an organization to meet the demands for service, quality, flexibility, and low cost. The need for simplicity should be prevalent whenever redesigning an organization. It may be beneficial to have more than one process. The first process would be for standard procedures, while other processes would handle special situations. (Hammer, 1993, p.55)

Another consideration that should be taken into account while reengineering a process is to combine as many jobs as possible. There are several benefits to this concept. First, this can eliminate the time it takes to pass paperwork from step to step. Second, it eliminates any errors that may be caused by the constant passing of paperwork and the rework associated with these errors. Finally, it provides a single point of contact for the customer which enables the better handling of customer inquiries. If one person cannot perform many functions because of the complexity of these functions, a case team or group can be established. This allows the same benefits as using one employee. Typically, a case worker-based process operates ten times faster than the assembly line version it replaces (Hammer, 1993, p.52).

Along with this horizontal compression comes vertical compression in BPR. Vertical compression means that the workers make decisions rather than having to go to a manager as is the normal case. Decision making becomes part of an employee's work. The potential benefits of compressing work are fewer delays, lower overhead, better customer response, and empowered employees. (Hammer, 1993, p.79)

In a reengineered process the steps are performed in a natural order. No artificial limits are placed on the sequence of events. The only restriction is that only processes that need to be done in sequence are done this way. This

allows the simultaneous performance of only the necessary steps. The result is the compression of the overall length of the process. (Hammer, 1993, p.51)

Another characteristic of a redesigned process is the lack of standardization. In a world of rapid change, no one standard process can handle all situations. If a process is designed to handle all situations it is usually very complex and must incorporate special procedures and exceptions to handle a wide range of situations (Hammer, 1993, p.55). By simplifying into multi-version processes, it is possible to handle the larger number of simple requirements in the least amount of time.

In a reengineered process, work is performed where it makes the most sense. This may involve switching tasks from one division to another, or it could mean having the customer perform some of the work. These improvements may change organization charts or communication requirements. The ultimate goal is to reduce hand-offs and decrease costs. (Hammer, 1993, p.56)

In the transformation of the organization, checks and balances are reduced. Audits and approvals are non-value-added activities that should be eliminated as much as possible. The focus is on the customer and what can better serve the customer while improving efficiency. If a review cannot be eliminated, it should be combined with other reviews if possible. This will minimize the amount of time spent performing these controls. (Manganelli, 1994, p.148)

Another form of non-value-added work is reconciliation. Reconciliations can be reduced by cutting back the number of external contact points and thereby diminishing the possibility of introducing inconsistent information. When differences are created, they consume enormous energy and damage the vendor-customer relationship (Hammer, 1993, p.62).

Another way to enhance the vendor-customer relationship is by establishing a single point of contact. This person is especially useful for

complex or scattered processes. These customer service representatives will need access to the data needed to answer customer questions and handle problems. These are the same data that are currently being worked in the process. Information technology is a key enabler in instituting this methodology. (Hammer, 1993, p.62)

Companies that have performed reengineering have the ability to combine the advantages of centralization and decentralization (Hammer, 1993, p.63). Information technology allows this possibility. A worker in a remote site can provide a level of service that a decentralized process allows while achieving the benefits of a centralized process through telecommunications.

G. THE USE OF INFORMATION TECHNOLOGY

Information technology cannot be utilized in the same manner that it has been in the past. Historically, firms have equated the use of computers with automation. This is incorrect. Simply automating a business process is not the same as performing BPR. This will only result in the same inefficient process done more quickly. (Hammer, 1993, p. 83) An efficient process that maximizes the abilities of information technology must be found. BPR is a method to determine the best process.

Information technology plays a critical role in BPR. It allows a company to reengineer a process if applied correctly. BPR is about innovation. Information technology allows an organization to break the old rules and create new ways of working. The latest capabilities of technology must be utilized to achieve the dramatic improvements desired. This requires imaginative thinking to create new ways of performing the process. (Hammer, 1993, p.90)

Information technology allows the improvement of a paper driven process through numerous functions. The use of electronic transmissions removes the need for paper and eliminates the need for physical co-location of personnel. Shared databases allow information to appear in multiple locations

simultaneously. Expert systems allow generalists to perform many of the functions of an expert and decision support systems can reduce management oversight. The application of information technology is only limited by the creativity of the people using it. (Hammer, 1993, p.95)

H. SUMMARY

Business processes have been operating in a similar fashion for the last century. In the information age, where change is happening at an extraordinary rate, the business process must also change to keep pace. Business Process Reengineering is a methodology that can enable this dramatic change. Although many acquisition reform initiatives have been enacted in the past, the Federal Acquisition Streamlining Act is the first that enables a dramatic improvement in the Federal contracting system. FASA's move toward commercial practices, electronic contracting, and paperwork reduction are fully compatible with BPR efforts. BPR looks at the focus of the process and identifies the most efficient method to perform that process. A key enabler to BPR is the use of information technology to improve processes.

III. NAWCWPNS SMALL PURCHASE PROCESS

A. INTRODUCTION

NAWCWPNS has developed its organization and business practices over time. These practices are somewhat driven by higher authority, but reflect the hierarchial model of various layers and sub-divisions that were popularized earlier in the 1900's (Hammer, 1993, p.11). This type of organization has resulted in a highly specialized worker who is very adept at a particular function. The continual breakdown in the layers of the organization is intended to simplify the tasks of each individual. The processes and procedures utilized by NAWCWPNS have been current to conform to established laws and regulations. This has been an ongoing process influenced by the passage of every new piece of acquisition reform.

B. NAWCWPNS ORGANIZATION

In any group activity the organizational structure is a factor which largely determines the level of performance obtained by the group as a whole (Dobler, 1990, p.93). The capabilities and motivation of the individuals combine with the organizational structure within which they function to obtain the given level of performance. The organizational structure reflects management's basic attitudes toward the major activities involved in its operation. NAWCWPNS's organizational chart reflects a common hierarchial structure that is broken down into purchasing divisions.

The China Lake operation at NAWC has 15 purchasing agents distributed among five purchasing divisions. The purchasing agents are directly responsible for the purchase, rental or lease of supplies and equipment through informal open market procedures and by formal competitive bid procedures to assure rapid delivery at fair and reasonable prices. This requires a knowledge of commercial supply sources as well as common business practices with

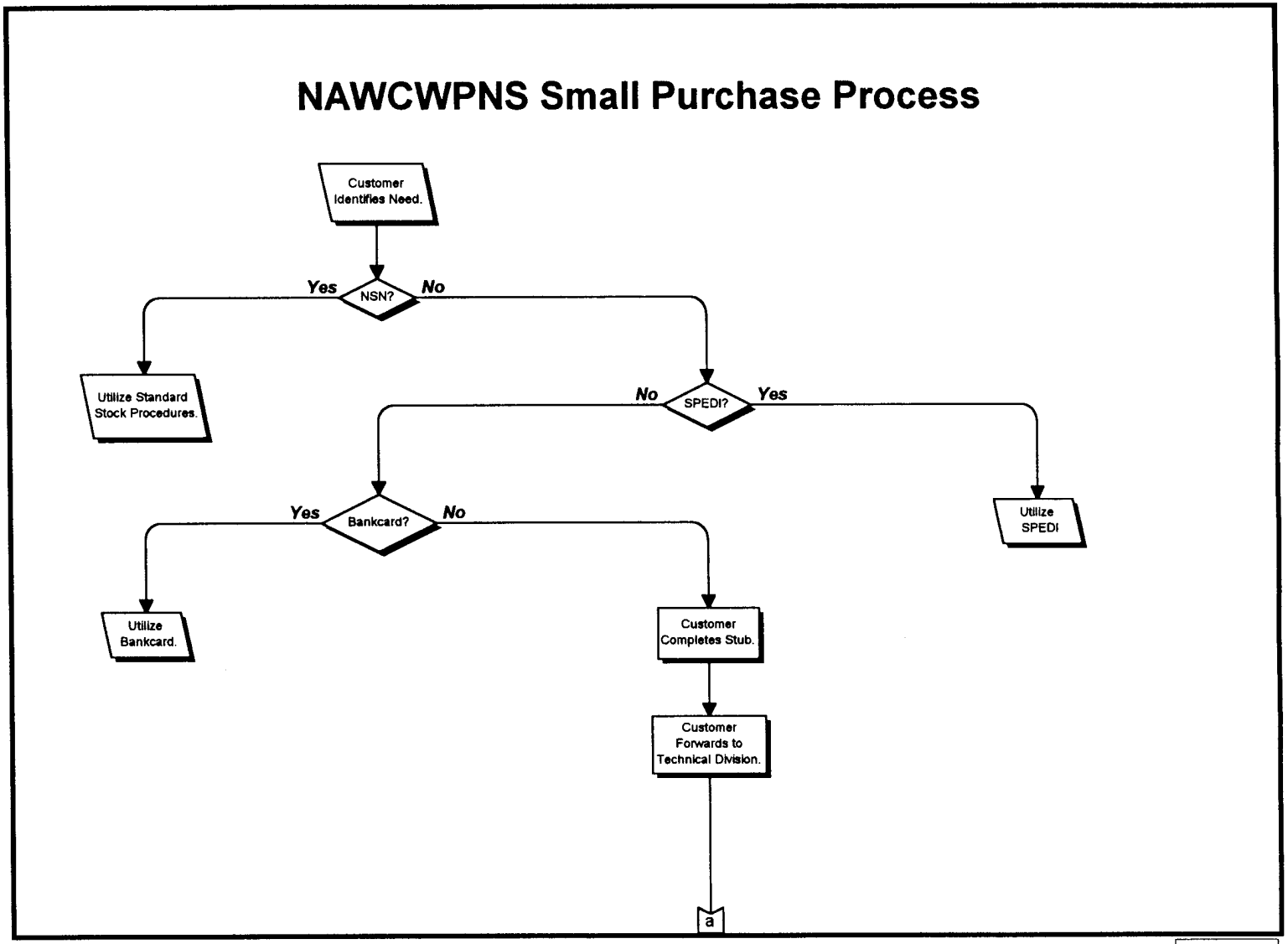
respect to sales, prices, discounts, deliveries, stocks and shipments. The purchasing agent must process complex administrative documents by researching applicable laws, rules, instructions, and/or regulations. These guidelines come from a variety of sources including the Federal Acquisition Regulation, the Defense Federal Acquisition Regulation Supplement, and the Navy Acquisition Procedures Supplement. The primary guidance utilized at NAWCWPNS is the Shore and Fleet Small Purchase and Other Simplified Purchase Procedures (NAVSUP INSTRUCTION 4200.85B).

The five purchasing divisions are located throughout the China Lake Weapons Station. This was done to allow purchasing personnel to be as close to the technical customer as possible. The large area of the China Lake Naval Air Warfare Station results in the wide dispersion of the purchasing division. This means that to meet with the people of the various purchasing divisions, one must drive by car. There is no easy method to get all the purchasing personnel together at one time. (Exley, L.)

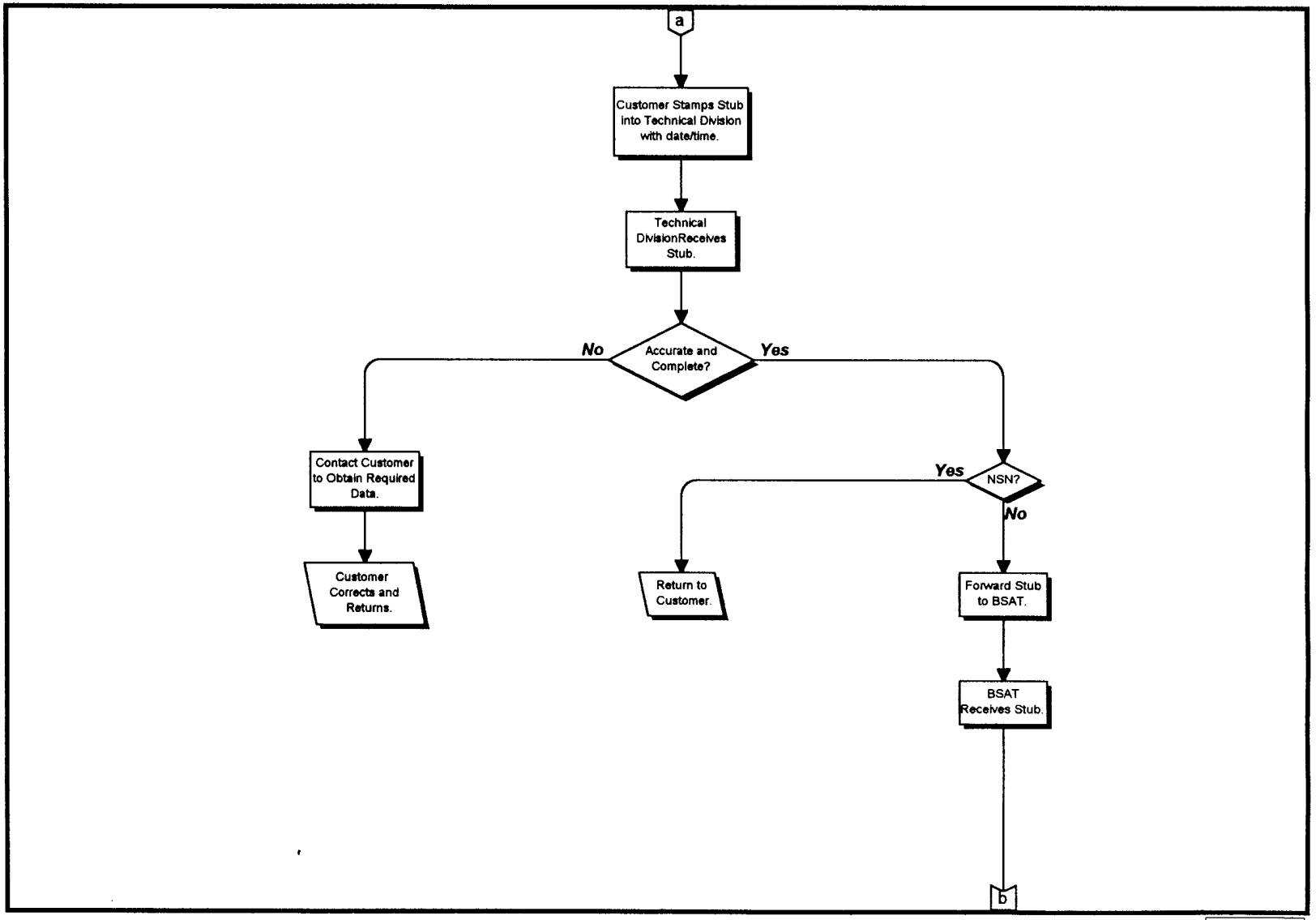
C. NAWCWPNS SIMPLIFIED PURCHASE PROCESS

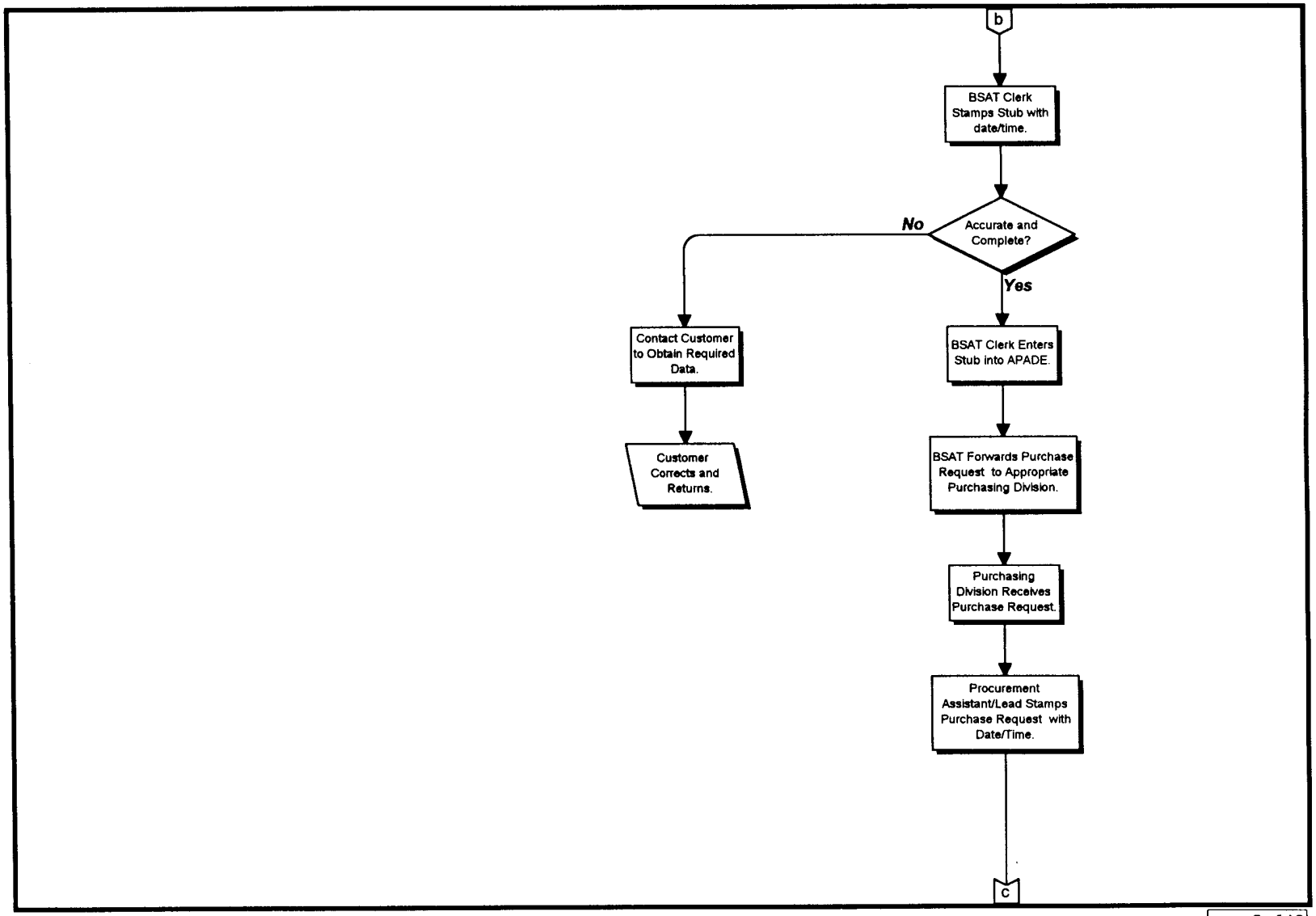
The simplified purchase method is the "traditional" method of obtaining supplies. It is the process that can be associated with the customer interacting with the purchasing agent to obtain needed material. Simplified purchasing is a flexible process that can handle one-time requirements or high volume needs. The dollar value associated with these procurements is anything up to the simplified acquisition threshold. The following description is substantiated in Figure 3-1.

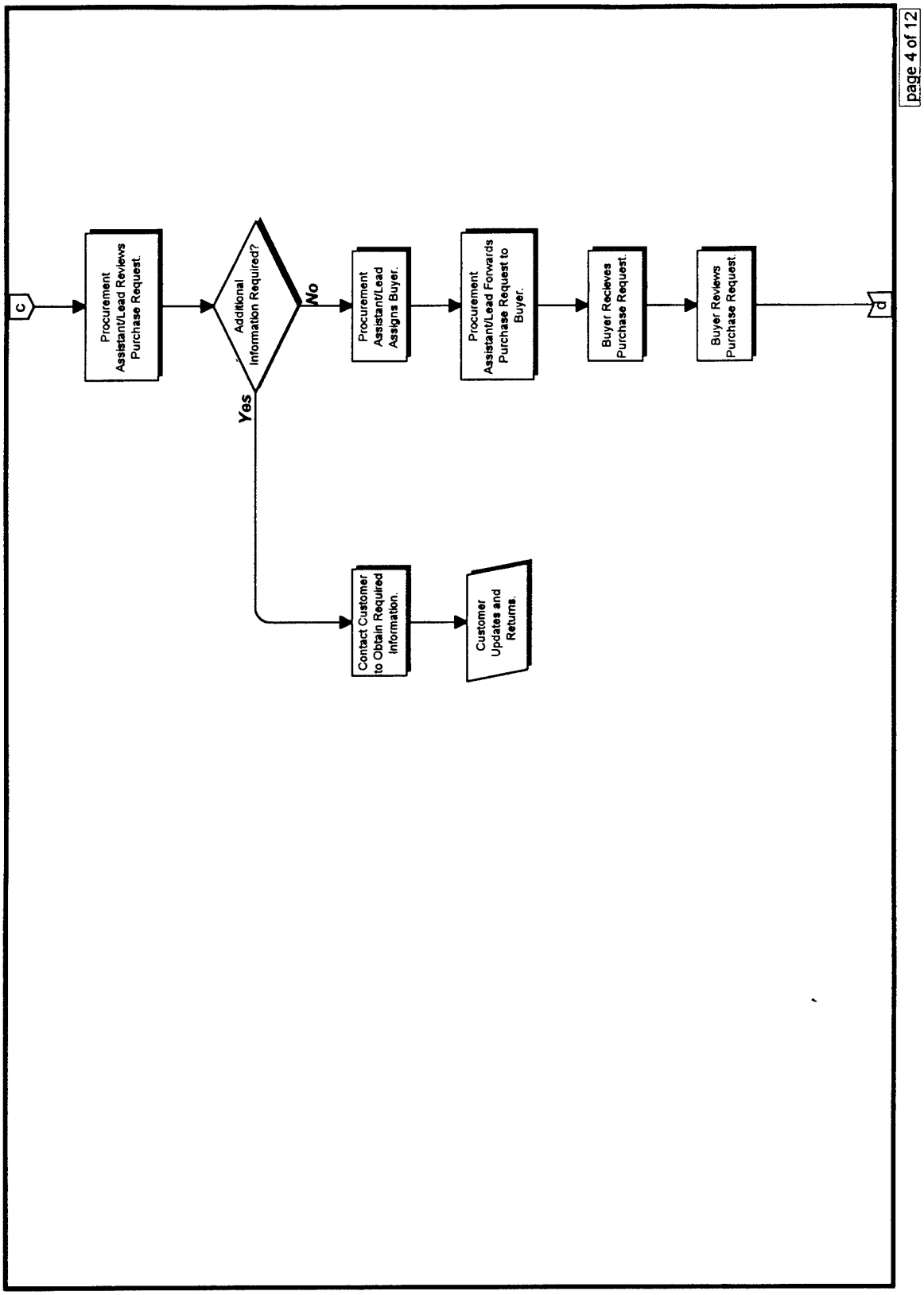
Figure 3-1

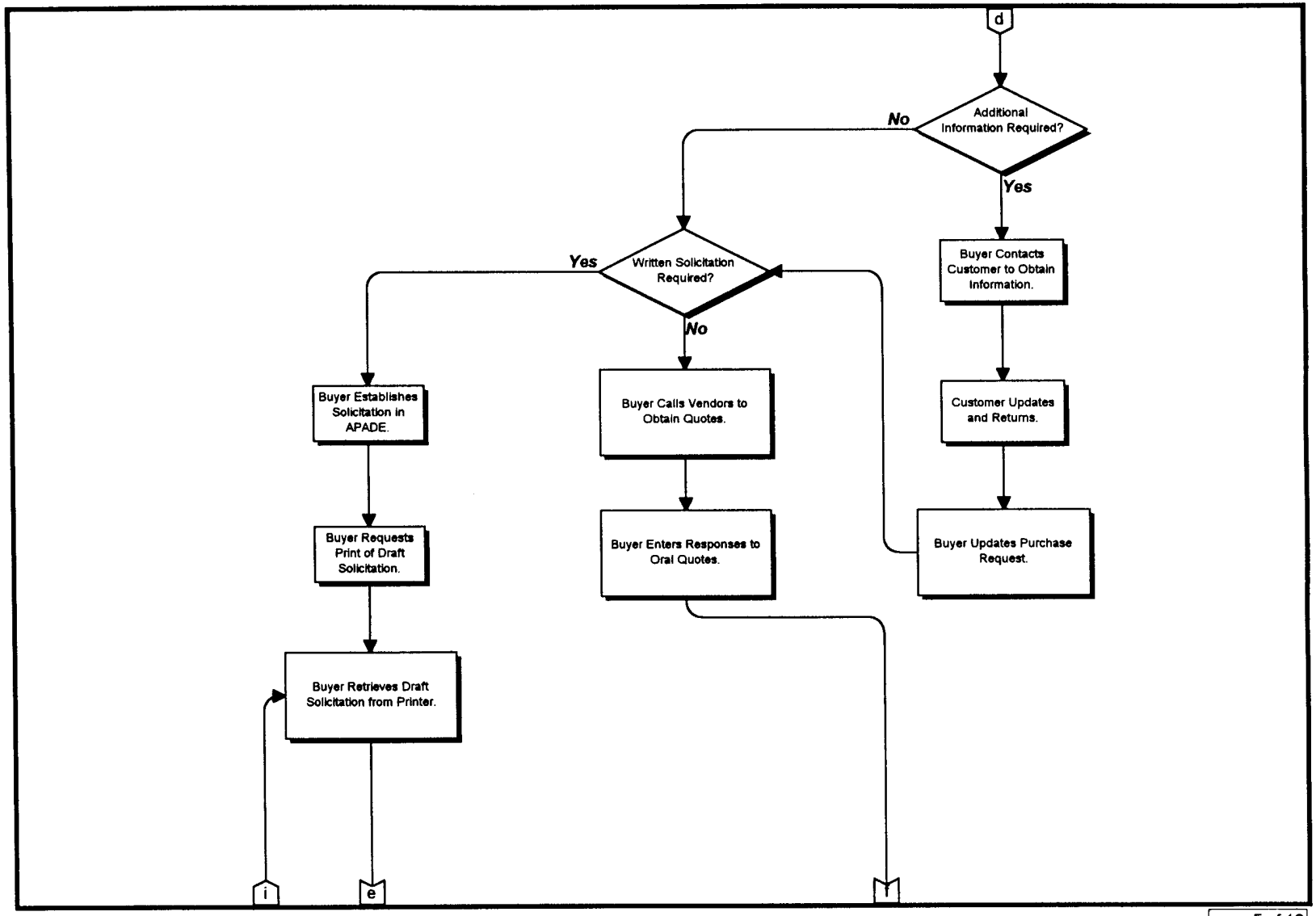


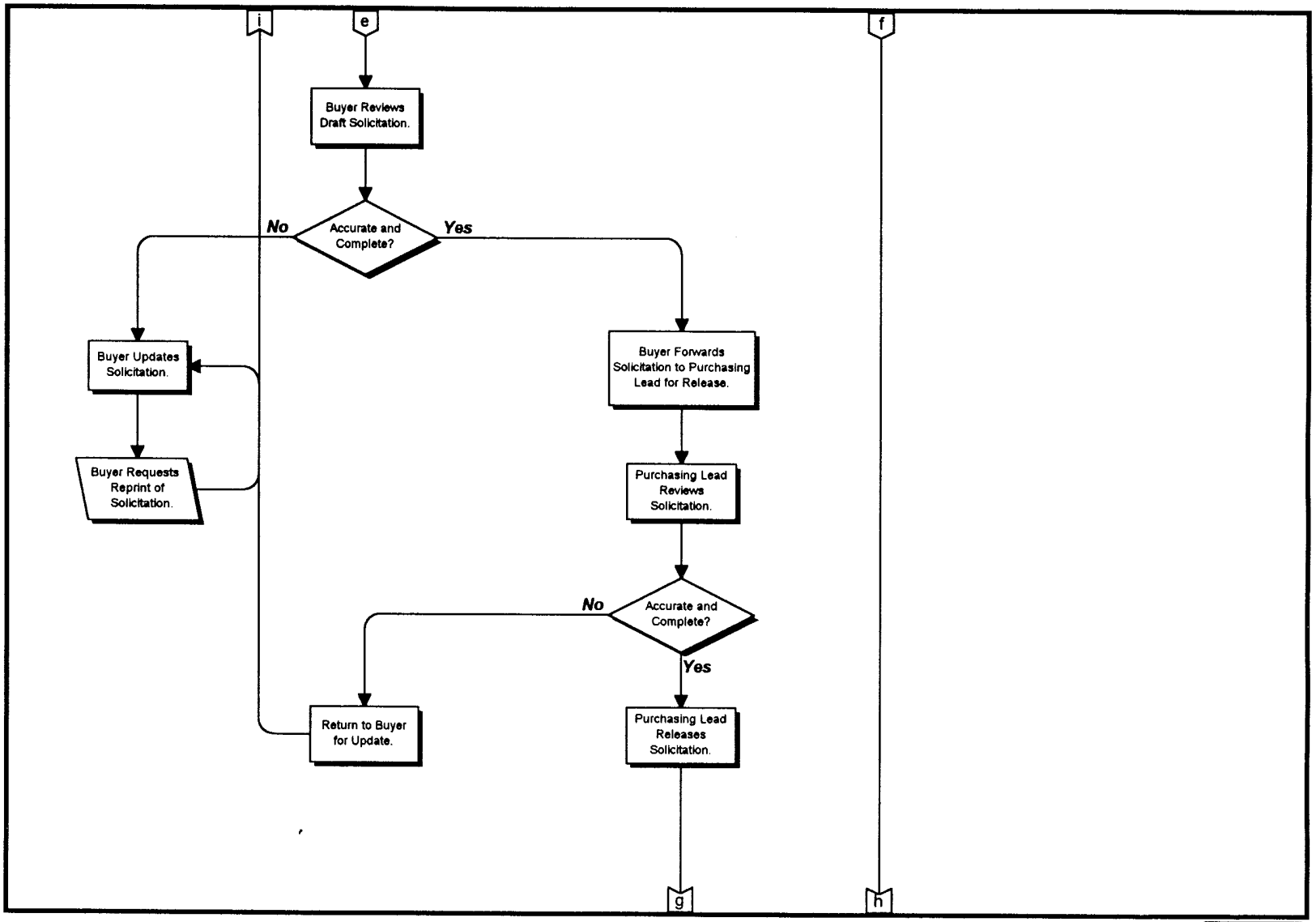
Source: NAWCWPNS

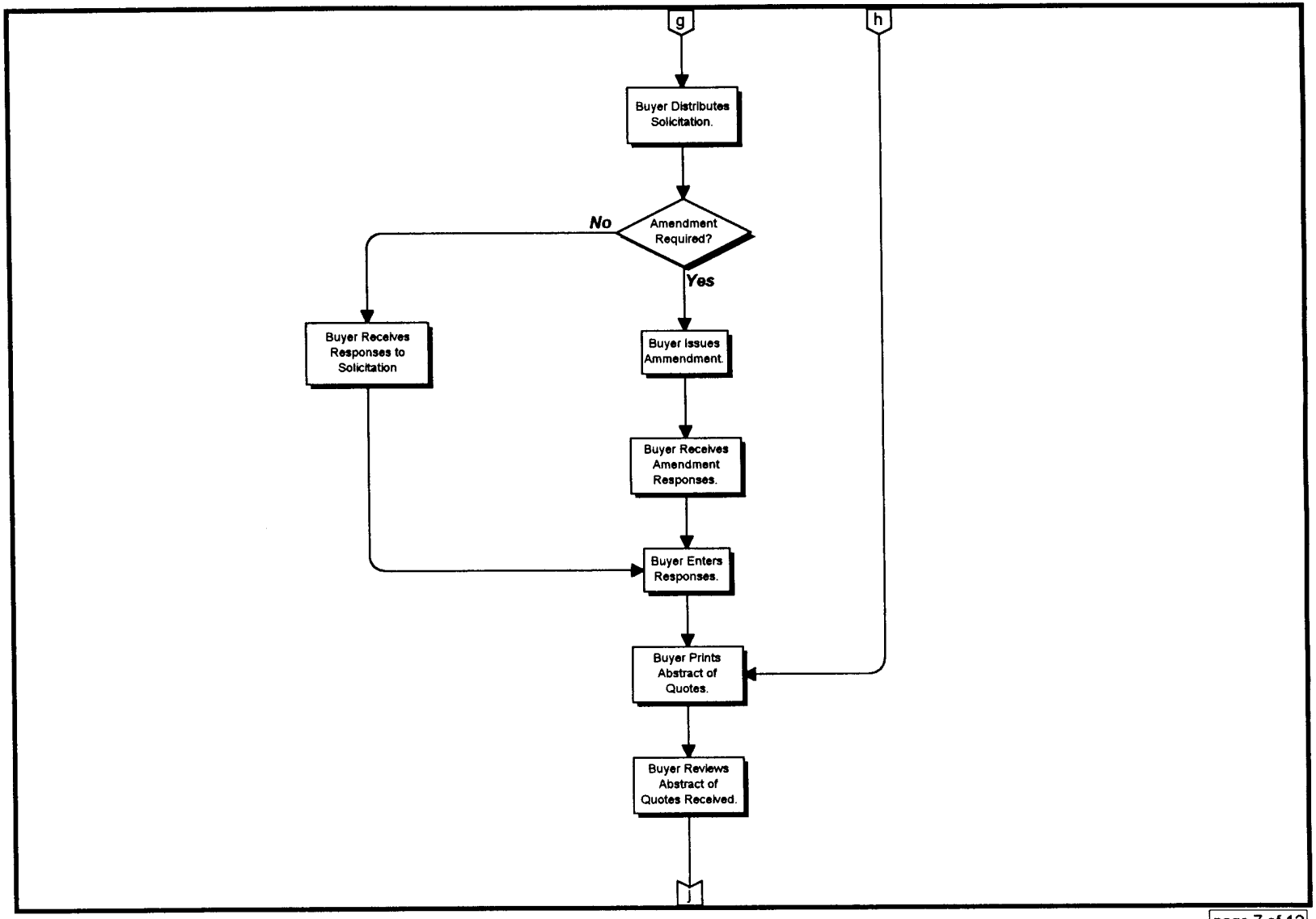

a
Customer Stamps Stub into Technical Division with date/time.
Technical DivisionReceives Stub.
Accurate and Complete?
No
Yes
Contact Customer to Obtain Required Data.
Customer Corrects and Returns.
Yes
NSN?
No
Return to Customer.
Forward Stub to BSAT.
BSAT Receives Stub.
b

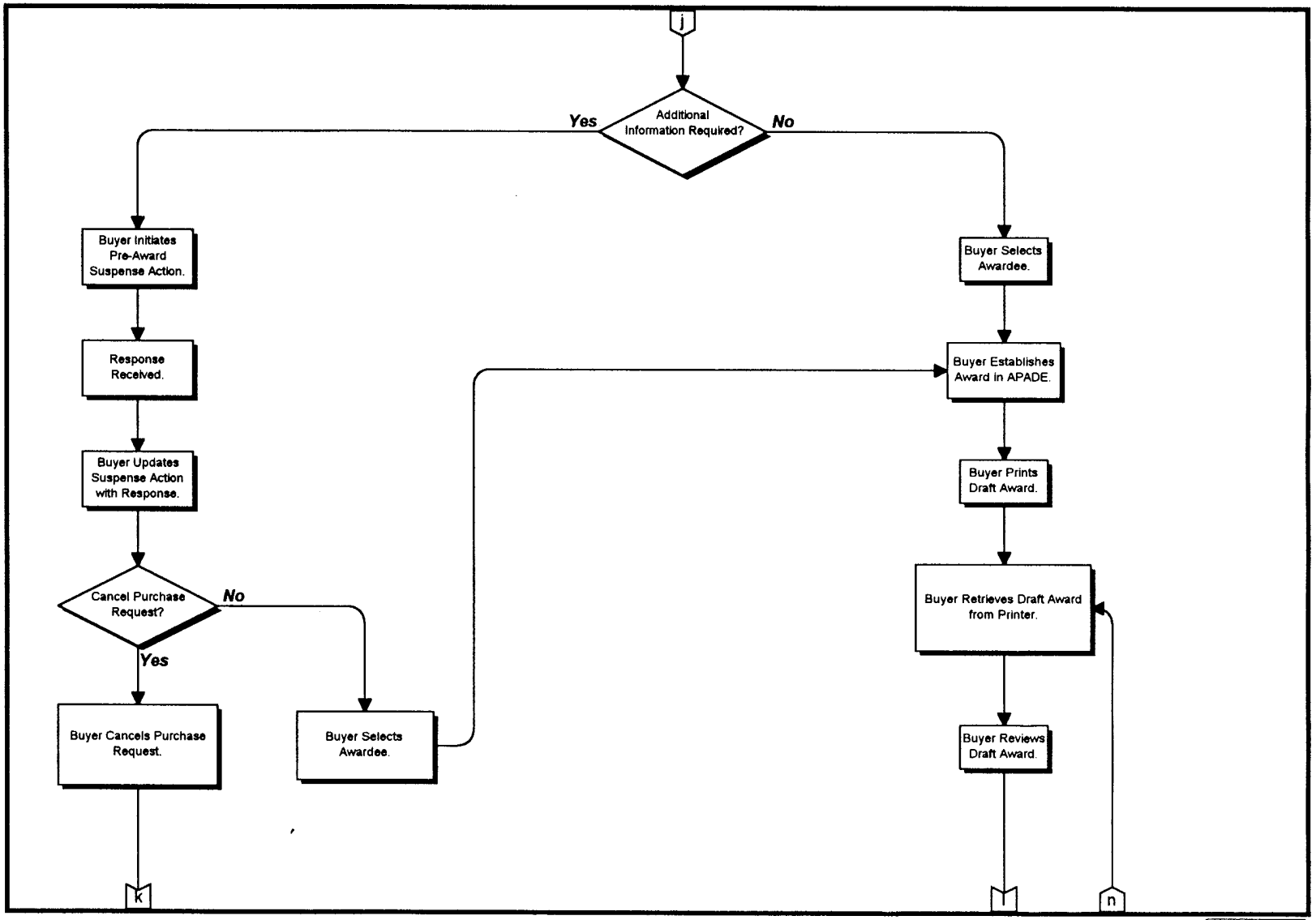

b
BSAT Clerk Stamps Stub with date/time.
Accurate and Complete?
No
Yes
Contact Customer to Obtain Required Data.
Customer Corrects and Returns.
BSAT Clerk Enters Stub into APADE.
BSAT Forwards Purchase Request to Appropriate Purchasing Division.
Purchasing Division Receives Purchase Request.
Procurement Assistant/Lead Stamps Purchase Request with Date/Time.
c

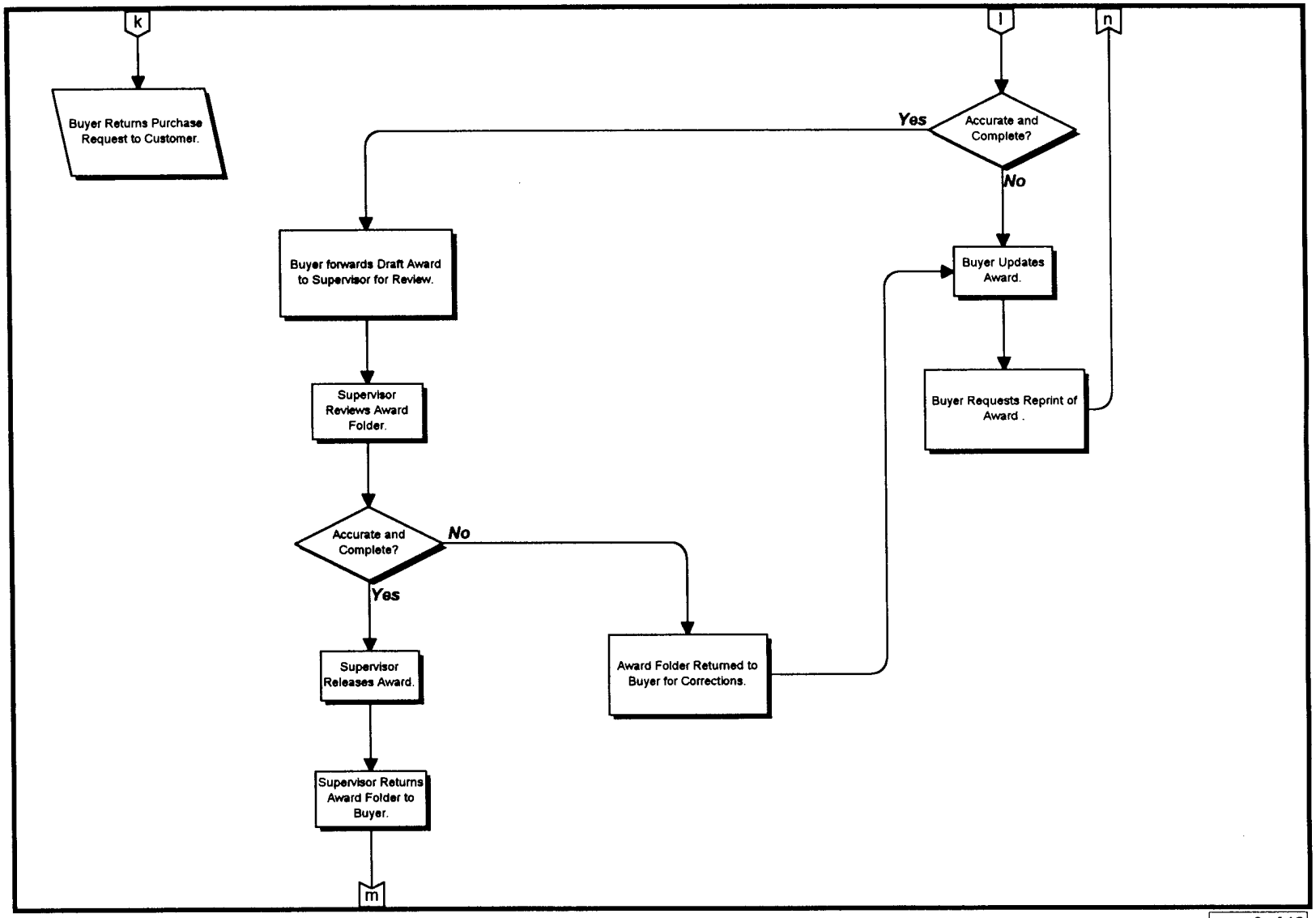

page 4 of 12
c
Procurement Assistant/Lead Reviews Purchase Request.
Additional Information Required?
No
Yes
Procurement Assistant/Lead Assigns Buyer.
Procurement Assistant/Lead Forwards Purchase Request to Buyer.
Buyer Recieves Purchase Request.
Buyer Reviews Purchase Request.
d
Contact Customer to Obtain Required Information.
Customer Updates and Returns.

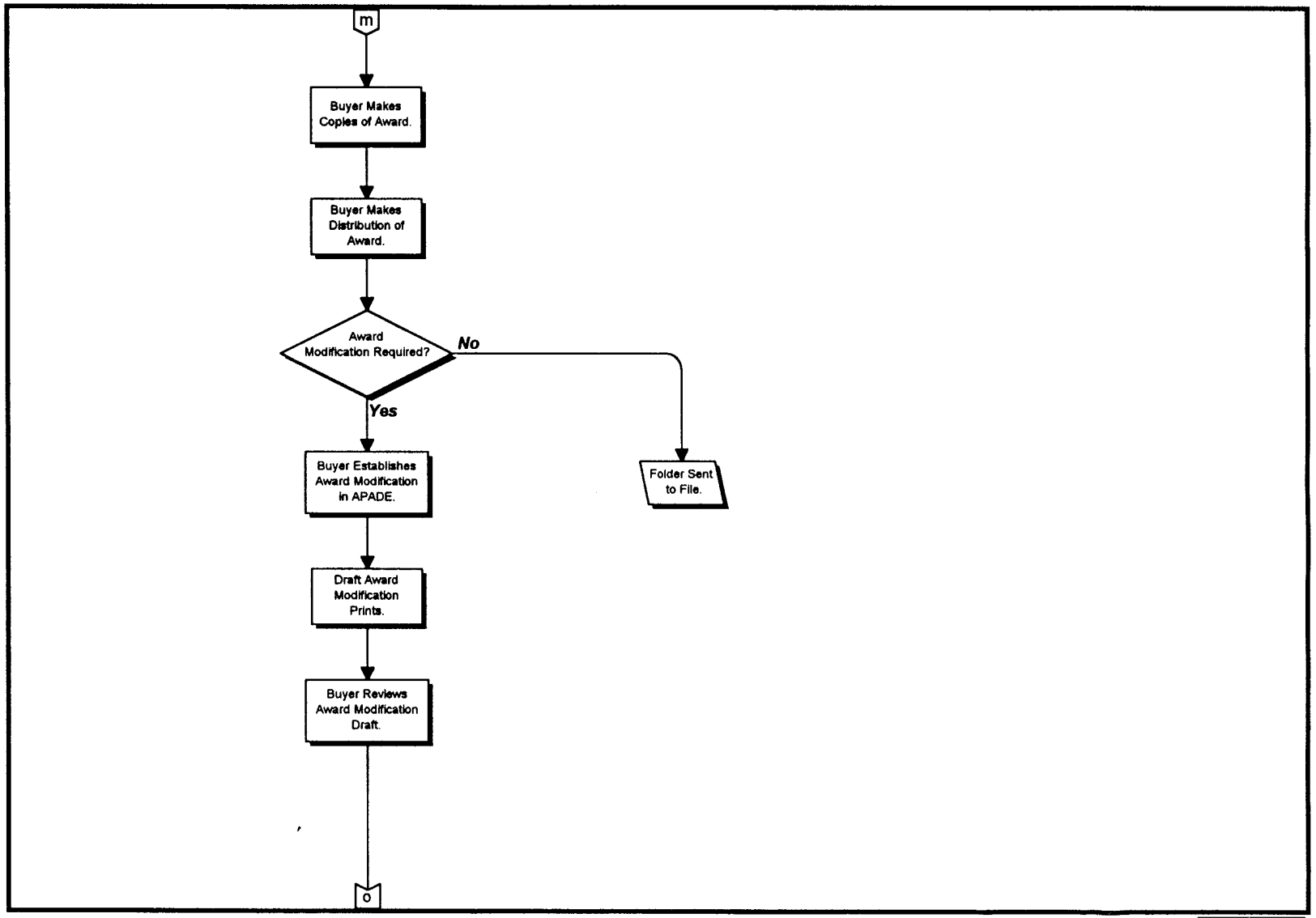

d
Additional Information Required?
No
Yes
Buyer Contacts Customer to Obtain Information.
Customer Updates and Returns.
Buyer Updates Purchase Request.
Written Solicitation Required?
Yes
No
Buyer Establishes Solicitation in APADE.
Buyer Requests Print of Draft Solicitation.
Buyer Retrieves Draft Solicitation from Printer.
Buyer Calls Vendors to Obtain Quotes.
Buyer Enters Responses to Oral Quotes.
i
e
f

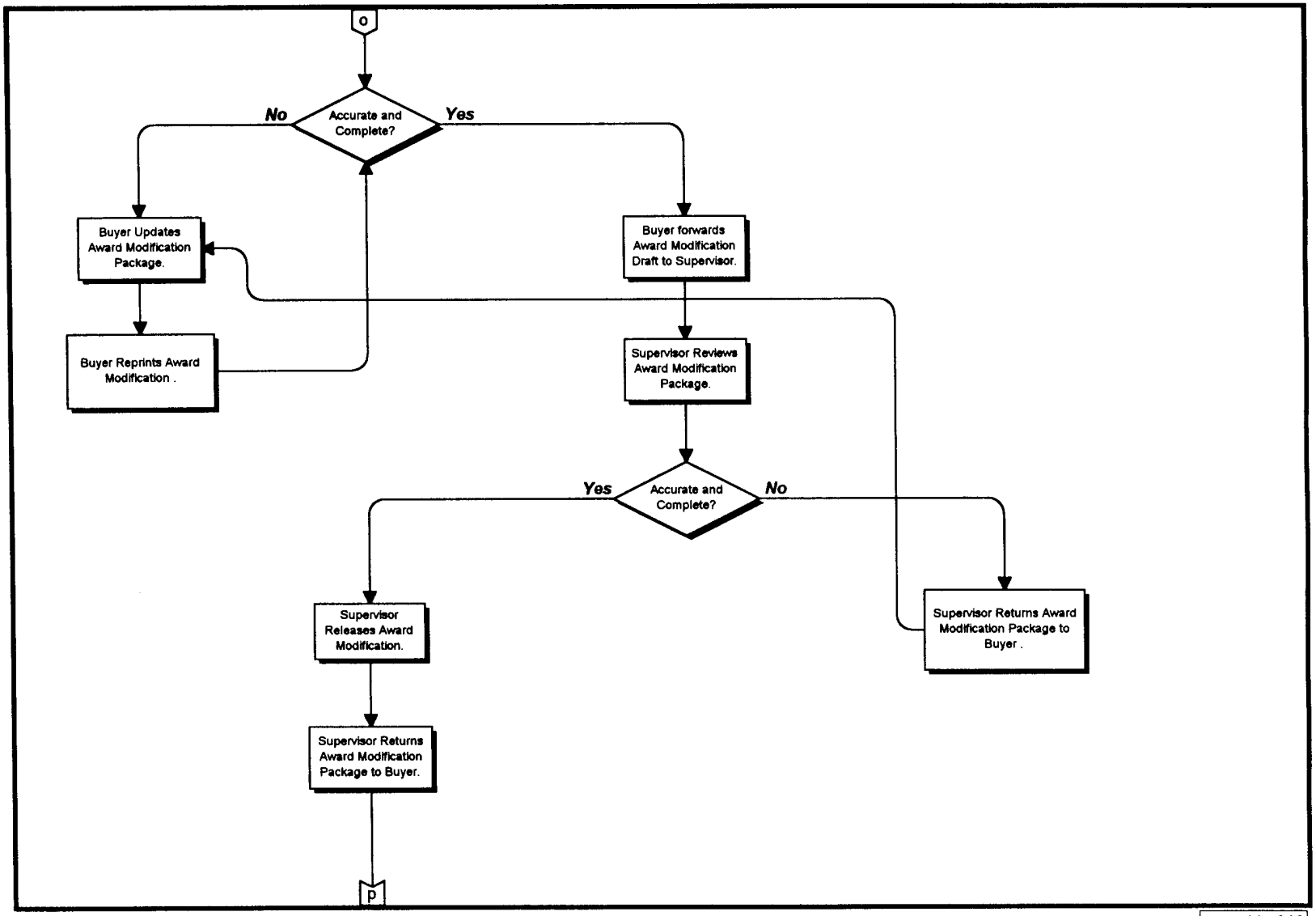

i
e
f
Buyer Reviews Draft Solicitation.
No
Accurate and Complete?
Yes
Buyer Updates Solicitation.
Buyer Requests Reprint of Solicitation.
Buyer Forwards Solicitation to Purchasing Lead for Release.
Purchasing Lead Reviews Solicitation.
No
Accurate and Complete?
Yes
Return to Buyer for Update.
Purchasing Lead Releases Solicitation.
g
h

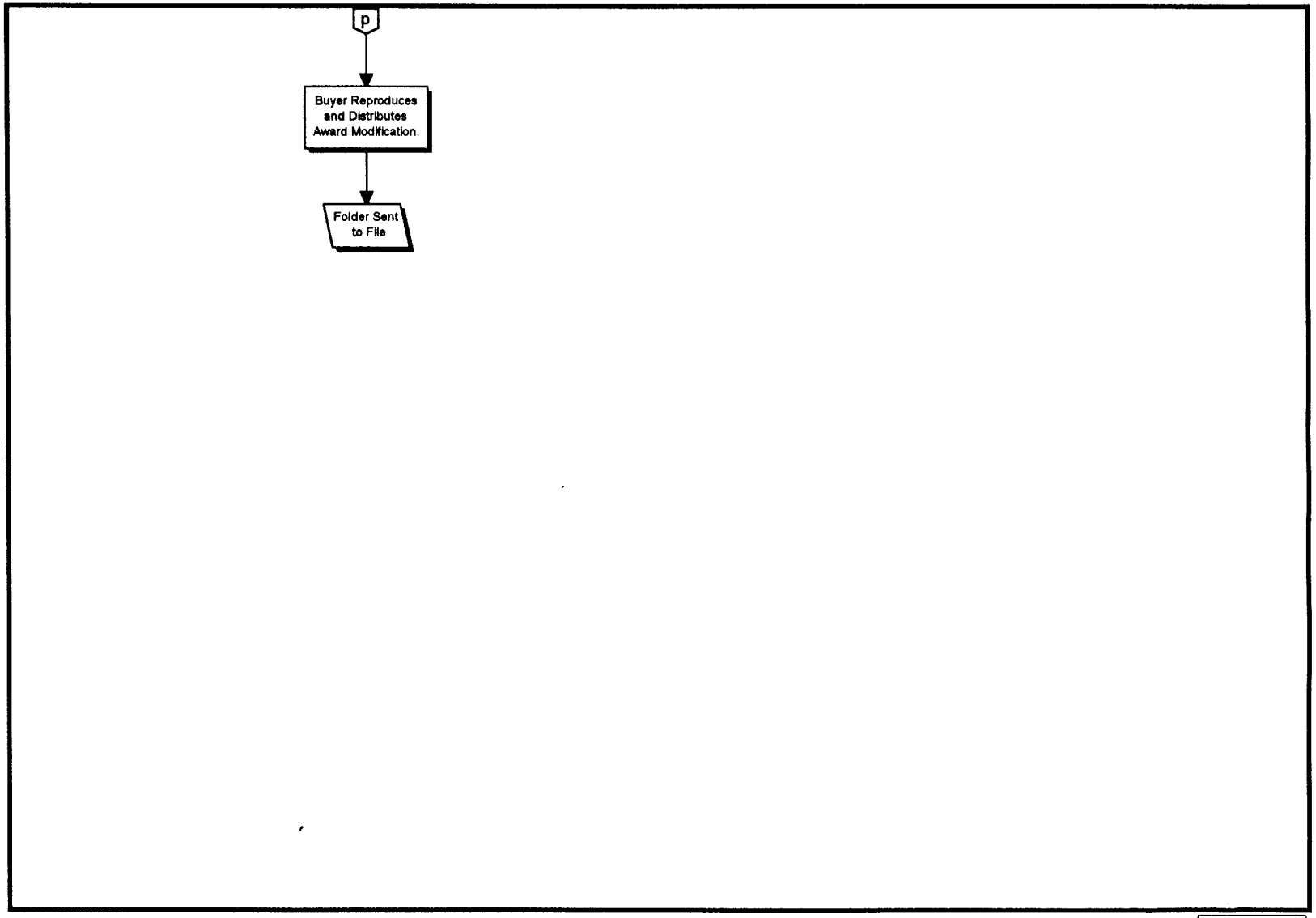

g
h
Buyer Distributes Solicitation.
Amendment Required?
No
Yes
Buyer Receives Responses to Solicitation
Buyer Issues Ammendment.
Buyer Receives Amendment Responses.
Buyer Enters Responses.
Buyer Prints Abstract of Quotes.
Buyer Reviews Abstract of Quotes Received.
j


j
Additional Information Required?
Yes
No
Buyer Initiates Pre-Award Suspense Action.
Response Received.
Buyer Updates Suspense Action with Response.
Cancel Purchase Request?
No
Yes
Buyer Cancels Purchase Request.
Buyer Selects Awardee.
Buyer Selects Awardee.
Buyer Establishes Award in APADE.
Buyer Prints Draft Award.
Buyer Retrieves Draft Award from Printer.
Buyer Reviews Draft Award.
k
l
n


k
Buyer Returns Purchase Request to Customer.
l
Accurate and Complete?
Yes
No
n
Buyer forwards Draft Award to Supervisor for Review.
Buyer Updates Award.
Supervisor Reviews Award Folder.
Buyer Requests Reprint of Award .
Accurate and Complete?
No
Yes
Supervisor Releases Award.
Award Folder Returned to Buyer for Corrections.
Supervisor Returns Award Folder to Buyer.
m


m
Buyer Makes Copies of Award.
Buyer Makes Distribution of Award.
Award Modification Required?
No
Yes
Folder Sent to File.
Buyer Establishes Award Modification in APADE.
Draft Award Modification Prints.
Buyer Reviews Award Modification Draft.
o


o
Accurate and Complete?
No
Yes
Buyer Updates Award Modification Package.
Buyer forwards Award Modification Draft to Supervisor.
Buyer Reprints Award Modification .
Supervisor Reviews Award Modification Package.
Yes
Accurate and Complete?
No
Supervisor Releases Award Modification.
Supervisor Returns Award Modification Package to Buyer .
Supervisor Returns Award Modification Package to Buyer.
p


p
Buyer Reproduces and Distributes Award Modification.
Folder Sent to File

The process begins with the need identified by the customer. If the material is not a standard stock numbered item, the customer starts down the small purchase flow path of Figure 3-1. After a customer has identified a need, they must determine if the required material is covered by a National Stock Number (NSN). If the required material is not covered by an NSN, then the customer must determine the procurement method desired. The choices are Small Procurement Electronic Data Interchange (SPEDI), Bankcard, and simplified purchase. SPEDI and Bankcard methods are discussed later in this chapter. If the material is covered by a SPEDI contract, it must be purchased with that method. If it is under the micro-purchase threshold, then it may be procured with the Bankcard. Anything else can be procured with the simplified purchase procedures.

The first step in the simplified purchase process is for the customer to fill out a Request for Materials/Services form (NAWCWPNS CL 449/1 Rev. 1-92), called a "Stub". The Stub is routed between the various organizations in the small purchase process. The customer is responsible for getting the Stub to the various processing points. If there is a special requirement, such as for hazardous material (HAZMAT), or automated data processing (ADP) equipment, the customer must obtain the required approvals. The customer is responsible for getting the Stub to the technical division.

The technical division is a contracted out service. The technical division is centrally located at NAWC. Many of the employees who work here are former Government employees. The customer stamps the Stub as received when it is brought into the technical division. When a Stub is in the technical division, it is primarily being screened to verify that there is not a National Stock Number (NSN). They have access to several computer databases and publications. If any discrepancies or questions arise, the technical division must either return the Stub to the customer, or contact that customer to get clarification. If a NSN cannot be established, the requisition is passed to the

Boeing Support Automation Team (BSAT). This can be done via guard mail (NAWCWPNS's internal mail system) or hand-carried by the customer. If the material is urgently needed, it will be hand-carried to expedite routing. There is only one BSAT location onboard NAWC.

The BSAT clerk stamps the Stub with the date and time received. The clerk screens the Stub for accuracy and completeness. BSAT screens represent a limited level of accuracy since they are not Government buyers. If the Stub is not accurate and complete, the clerk must contact the customer to obtain the required data. If no discrepancies are identified, the BSAT clerk then enters the Stub as a purchase request into the Automated Procurement and Accounting Data Entry (APADE) system. APADE is discussed in the next section. Once the Stub has been skeletonized in APADE, it is passed to the appropriate Purchasing Division via guard mail. The correct Purchasing Division is determined by who the customer is. Each division serves specific customers.

Once the Stub is received in the Purchasing Division, the Small Purchase Point of Contact (SPPOC) stamps the purchase request (Stub) with the date and time received. The SPPOC then reviews the purchase request for adequacy, assigns it to a buyer, and distributes the purchase request.

There are two to four buyers in each division. The buyer performs an initial screen of the Stub to see if there is adequate information available to perform the purchase. If additional information is required, the buyer contacts the customer to obtain the required information and updates the purchase request. Normally, the purchase request is returned to the originator for modification. The minimum information necessary includes:

- Funding.
- Adequate purchase description or specification of work which may include a part number.
- Contractor and Government Entity Code, if applicable.

- Quantity.
- Required Delivery Date.
- Place of Delivery.
- Previous buy information, or a price estimate and the basis for that estimate.
- Sole source justification if required.
- A point of contact for technical questions and acceptance of supplies or services.
- Any unique requirements.
- A document number.

If the requirement involves any unique requirements such as hazardous material (HAZMAT) or automated data processing equipment (ADPE), special approvals must be obtained. This significantly complicates the process. For example, when the buyer has the purchase request, he/she must determine if the material falls into the HAZMAT or ADPE category. This is not easily accomplished and sometimes requires input from potential vendors.

If the purchase request is satisfactory, a determination of the need for a written solicitation must be made. A written solicitation is needed if: detailed specifications or Statement of Work are involved; numerous items are included in a single action; suppliers are from outside the local area; oral solicitations are not considered prudent or appropriate; or unusual clauses are required (NAVSUPINST 4200.85B, pp.3-31). A written solicitation requires a more complicated process.

If a written solicitation is not required, the buyer contacts vendors to obtain quotes. This is normally done by telephone. The quotes are entered into APADE as described in the written solicitation procedures below and the process continues in a similar fashion.

If a written solicitation is required, the buyer establishes the solicitation in APADE and prints out a copy of the automated DD Form 1155 Request for Quotation (RFQ). The buyer must walk to a centrally located printer to retrieve the solicitation. If the solicitation is accurate and complete, it is forwarded to the SPPOC. The SPPOC reviews the RFQ and returns it to the buyer until the results are satisfactory. Each iteration required to improve the RFQ requires the buyer to enter APADE, make the changes and print a new copy of the solicitation.

Once the solicitation is approved by the SPPOC, the buyer then releases the solicitation. Solicitation amendments are issued as required, if the needs of the customer change. As quotes are received from vendors, the buyer enters the responses into APADE. When all responses have been received and entered into APADE, an abstract of quotes is then printed. Once the abstract is retrieved from the printer, it is reviewed to see if additional information is required. If additional information is needed, the solicitation is put into suspense until the required information is obtained. To get the information the buyer usually contacts the potential vendor by telephone.

Once all needed information is obtained, the buyer then selects the awardee and establishes the award in APADE. The buyer prints the draft award and reviews it for accuracy and completeness. The draft is then forwarded to the SPPOC, who reviews the award folder for accuracy and completeness. If the SPPOC is satisfied with the award, it is released and returned to the buyer. The buyer makes copies of the award and distributes it.

Occasionally, purchase orders may require modification. If the order requires a modification, it is established in APADE. The procedures to process a modification within APADE are similar to the original solicitation process.

D. AUTOMATED PROCUREMENT AND ACCOUNTING DATA ENTRY (APADE)

APADE was designed to operate within the Navy's SPLICE network on a Tandem computer system. The objective of APADE is to automate the procurement process. Some of the methods utilized to achieve this objective are (Pointer, 1983, p.4):

- Tracking/Document Control of Purchase Requests/Requisitions.
- Automated Preparation of Standardized Formal Procurement Documents.
- Source Data Automation.
- Procurement Management Information Reporting.
- Real Time Interactive Processing.

The APADE system is the heart of NAWCWPNS's small purchasing operation. It encompasses the basic functions required by a procurement system. APADE has transformed many of the historically manual procedures into an automated form. Some of the system designs are user friendly, but some user functions are difficult to perform without experience. Some logically related functions are located in different subsystems. For example, when moving into the award entry portion of APADE, the purchase request number may not be carried forward. This requires the buyer to manually reenter it to continue. (LaGore)

E. SMALL PROCUREMENT ELECTRONIC DATA INTERCHANGE (SPEDI)

SPEDI was introduced at NAWCWPNS in 1991. It operates through a computer Electronic Data Interchange (EDI) link to vendors. The objective is to obtain high volume off-the-shelf items with very little risk to the customer (Stevens). Individual requirements contracts have been negotiated with vendors

in commodity areas. For example, the first SPEDI contract was for office supplies. Currently there are five SPEDI commodity areas.

Customers determine their requirements by using catalogs provided by each vendor. After the desired material is identified then the user can go on-line to create a shopping list and place an order. The SPEDI system verifies the availability of funds, then transmits the order to the vendor. The material is normally shipped the next day. SPEDI creates a bar code label, which allows the constant tracking of material from the vendor to the customer. Vendors are paid via SPEDI within 10 days of material shipment.

SPEDI was created to help relieve some of the traditional small purchase burden. It is considered a success for what it has accomplished so far. SPEDI has enabled NAWCWPNS to meet many objectives, such as (Stevens):

- Obtaining Quantity Discounts
- Shortening Procurement Lead Times
- Reducing Warehouse Inventories
- Improving Vendor Accountability
- Providing Real-time Data
- Shortening Vendor Payment Cycle

SPEDI complies with all supply and procurement regulations including the FAR and Defense Federal Acquisition Regulation Supplement (DFARS). It is primarily used for non-standard stock material. Standard supply system material must be procured unless it does not meet the minimum requirements of the end user. The automated features SPEDI provides allow the tracking of specialty items, such as hazardous material, and the generation of numerous management reports. These reports include typical usage and financial reports, and many contractor performance reports. Since the entire process is

automated from beginning to end, gathering the desired information is uncomplicated.

F. NAWCWPNS BANKCARD PROGRAM

The NAWCWPNS Bankcard program was established in 1988 to help reduce the burden of small purchase personnel. It was designed for the procurement of low volume, specialty items below the $2,500. It allows real-time buying and the potential to take advantage of one time low price offers. Bankcard purchases are made directly by the customer at the supplier's location. The customers at NAWCWPNS prefer this method due to the quick delivery time and the hands on purchasing ability (Exley, L.).

The customers are provided training in the use of credit card purchases. Since the customer becomes the buying agent, most paperwork is eliminated and material is received much more quickly.

G. SUMMARY

This chapter provided a descriptive breakdown of NAWCWPNS small purchase processes. The processes included the "normal" small purchase system, NAWCWPNS Simplified Purchase by EDI (SPEDI), and Bankcard program. Each method of procurement has unique capabilities and limitations for use. The most flexible is the normal method of procurement which can obtain any material up to the small purchase threshold. However, SPEDI and Bankcard have the ability to get material to the customer more quickly.

IV. REENGINEERING ANALYSIS OF THE SMALL PURCHASE PROCESS

A. INTRODUCTION

Since all Department of Defense organizations must conform to the established laws and regulations, there must be a framework established to obtain the radical improvements of business process reengineering. This framework exists from the passage of the Federal Acquisition Streamlining Act of 1994 (FASA) and from top-level management at NAWCWPNS. As mentioned earlier, FASA has provided the impetus for substantial change, especially in the area of small purchases. NAWCWPNS's Contract Competency Division has expressed a strong desire to have the best purchasing operation possible. In analyzing the current procurement system utilized by NAWCWPNS the issue is whether process reengineering can be applied to obtain increased efficiency and effectiveness.

In order to analyze the process the first question that must be asked is what is the mission of NAWCWPNS? Along with the mission, the current process and the customers must be identified and their desires known. This, along with implementation of BPR, is discussed in the following sections.

B. IMPLEMENTING BUSINESS PROCESS REENGINEERING

The objectives of performing reengineering at NAWCWPNS is to develop new models which add value to the customer throughout the process. This will result in a more productive, cost effective small purchase system. If the breakthroughs that BPR can provide are attained by NAWCWPNS, there will be a mutual benefit to the contracting organization at NAWCWPNS as well as the technical customer.

The implementation phase is the most difficult portion of the reengineering project. Problems that could arise include the tendency to force the changes on employees from the top down without providing adequate

training. Other potential problems that need to be addressed are preparing the organizational infrastructure, performing a pilot test of the reengineered process, and the development of a plan to phase the old process out and the new process in. (Roberts, 1994, p.42)

There is no right or wrong way to implement the changes, just the way that works for the organization. When performing BPR, a framework is more useful than a methodology. (Roberts, 1994, pp.45-57) The framework, shown in Figure 4-1, provides the basic ideas for implementation that can be adapted to NAWCWPNS organization. The first step in this framework is gap analysis. The following three things are determined during this phase:

1. The way things are.
2. The way things should be.
3. How best to reconcile the difference between the way things are and the way they should be. (Roberts, 1994, p.48)

If it is discovered while performing this phase of BPR that there is not a big gap between where one is and where one wants to be, then incremental methods may be more beneficial. It is easier and quicker to use one of the incremental improvement programs mentioned in Chapter II than to utilize a full-blown BPR effort. The opportunity assessment provides information about the way things could possibly be. Information must be obtained to identify areas for possible improvement. (Roberts, 1994, p.50)

Once the information is gathered for possible improvements, it is combined with the current capabilities to form the basis for reengineering the process. This is where the analysis of what is not being done that should be and what must be done differently. The results of this phase are the basis for reengineering the process. (Roberts, 1994, p.51)

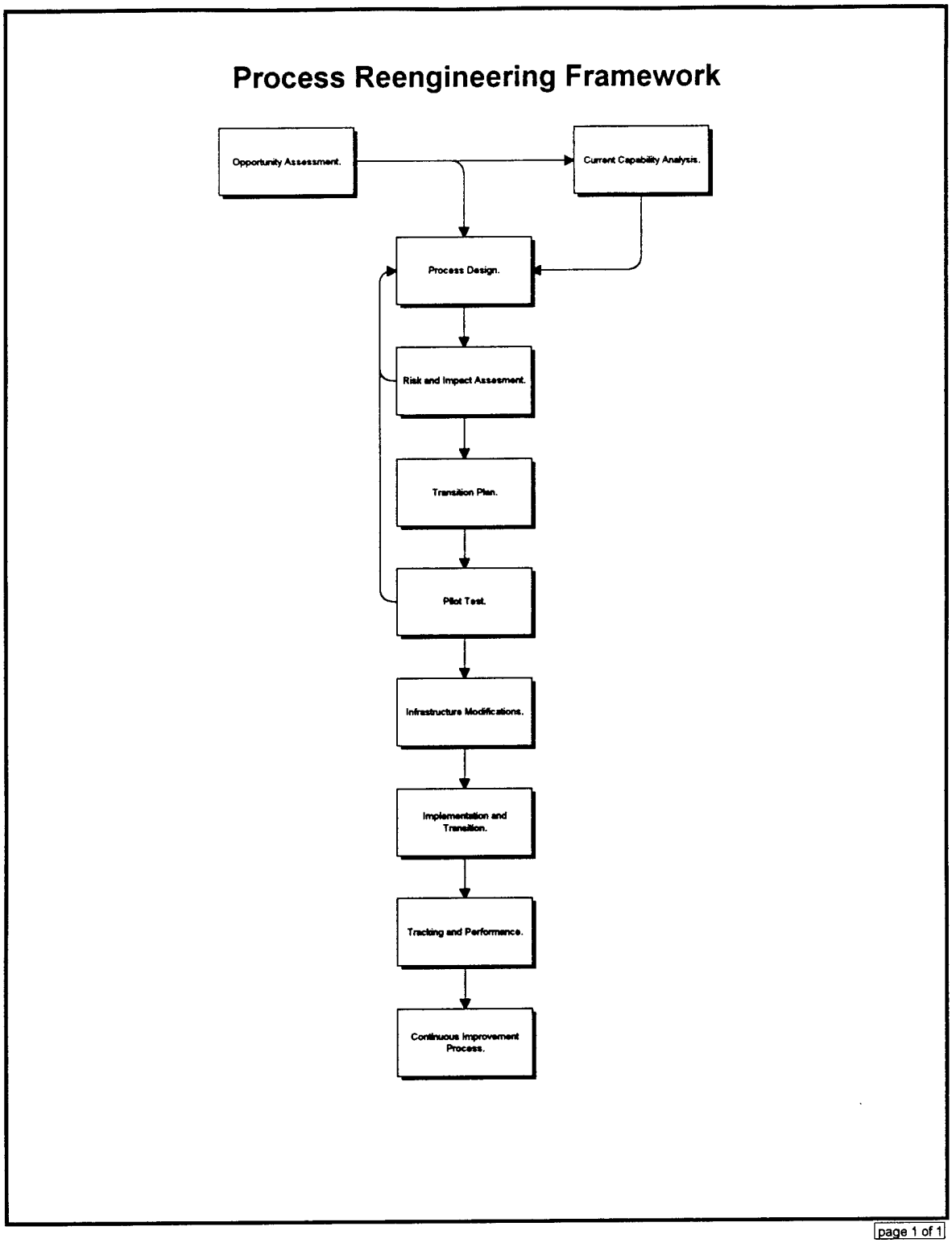


Figure 4-1 Source: Roberts, 1994, p.47

The risk and impact assessment are next. It is not necessary to identify and mitigate every risk, only those most severe. Since totally new procedures may be established, it is not possible to classify all risks. In contrast to risks, the potential benefits should be identified at this stage. This allows a risk/benefit analysis to be performed. It is desirable, but not mandatory to quantify this analysis. (Roberts, 1994, p.52)

The transition plan entails the details of implementing the process changes. This phase takes on more importance as the significance of the changes increases. The following concerns need to be addressed:

- How will changes be made in the infrastructure of the organization to accommodate the reengineered process?
- How will the process changes be phased in to minimize the impact on operations?
- How will those who own and control the process be involved in the transition and trained to use the process in its new configuration?
- What measurements and checkpoints should be established to monitor the performance of the new process configuration? (Roberts, 1994, p.53)

A pilot test allows potential problems to be eliminated prior to fully implementing process changes. If all aspects of the reengineered process cannot be tested, that should be identified. As shown in Figure 4-1, if the pilot test is not satisfactory, it is possible to return to the design phase. If only minor adjustments are needed, this can be done without going through the design, risk, and transition phases again. (Roberts, 1994, p.54)

The needed infrastructure modifications is the next area to analyze. The issues to address here are: What changes in facilities, technology, systems, and equipment are needed to support the new process? How will changes in the infrastructure impact other processes and the organization at large, both

during the transition and after? Once the changes have been identified, it is time to implement the changes. (Roberts, 1994, p.55)

The implementation and transition stage is the most challenging. The people responsible for the process should have been involved throughout the reengineering effort, so resistance to the changes should be minimized. There are several methods that can be utilized for implementation. A popular method is to keep the old system running until the new one is working. This is known as operating in parallel since there are two fully functional systems. At the other end of the spectrum is the plunge method. This involves stopping one system and using another. The new system could also be phased into use gradually. (Roberts, 1994, p.56)

Once the new system is implemented, it needs to be substantiated. Management needs to verify that the process as it has been changed, does what it is supposed to do. This can be done by comparing benchmarks to other parameters or to the old process. A typical purchasing bench mark is Procurement Administrative Lead Time (PALT). This is a measure of how long it takes a contracting activity to write a contract. However, from the customer perspective, this may not be a good measure. PALT does not measure the time it takes to get a request to the contracting organization or the time it takes to receive material. A better measure is the overall cycle time from the time the customer identifies their need to when they receive the required material.

C. ANALYZING THE OBJECTIVE OF NAWCWPNS

Understanding the business or mission of the small purchasing operation provides the direction for the reengineering process. Once the overall objective has been identified, then it is possible to pinpoint those activities that do not add value to the process. These are the activities that can potentially be eliminated. The overall objective of NAWCWPNS small purchase is to provide the customer the desired material in a timely efficient manner. After satisfying

the customer's needs, then the overall cost of doing business should be minimized.

NAWCWPNS customers are the personnel throughout the China Lake Naval Weapons Station. This includes a variety of occupations, but the majority of customers work in research and development. NAWCWPNS is chartered to support the research, development, test, and evaluation (RDT&E) requirements of Navy weapon systems. A key factor in performing RDT&E is the ability to move quickly from concept to employment. Any time that can be reduced in the acquisition process will directly lead to NAWCWPNS mission fulfillment.

NAWCWPNS has decentralized its purchasing process into distinct divisions located near their customer base. This was done to provide better service to the customer. This allows each division to be flexible in their operation, and to coordinate with the customers. NAWCWPNS's purchasing divisions exist solely to benefit the customer. However, this benefit is lost to the customer due to the single locations of BSAT and the technical division.

The options now available to fulfill the small purchase function include Bankcard, SPEDI and the traditional small purchase programs. Current laws and regulations do not allow all small purchase requirements to be met with Bankcard and SPEDI. Bankcard purchases are limited to $2,500 and SPEDI can only handle highly used material that has been set up on a prearranged contract. Therefore, there is still a viable need for traditional small purchase actions.

SPEDI and Bankcard were established to reduce the burden on the small purchase system. Historically, NAWCWPNS has utilized small purchase processes about 44,000 times per year. In fiscal year 1988, all of these requirements were through the traditional method since this was the only option. In fiscal year 1993, SPEDI was utilized 18,447 times, Bankcard was used 18,496 times, and the traditional small purchase method was used 7,311

times. Although traditional small purchase has fallen to less than 20 percent of the overall purchasing actions, it is still the most important. Some of the material acquired via this process may never be obtained through SPEDI or Bankcard. These items would be unique to NAWCWPNS's research, development, test, and evaluation mission. The time to obtain this material should be compressed as much as possible. Additionally, if the small purchase process were simplified, it may become more popular with the technical customer. (Exley, L.)

D. PURCHASING PROCESS ANALYSIS

When analyzing the small purchase process at NAWCWPNS, the basis is the value added to the customers end objectives. The primary question to ask is: Is this system necessary to achieve the desired results of the process? The objective of the NAWCWPNS customers is to receive the desired material or services as quickly as possible. To achieve this desire, material must be ordered as soon as possible. Reengineering principles dictate that processes remain as simple as possible to provide the quality, service, and flexibility needed (Hammer, 1993, p.51).

Consider the numerous steps in the current process that take place prior to the purchase request (Stub) reaching the appropriate buyer. The technical customer identifies their requirement and completes the purchase request. The purchase request is then taken to the technical division for review. The technical division forwards the Stub to the Boeing Support Automation Team (BSAT). After BSAT establishes the requirement into APADE, it is sent to the purchasing division. Once it reaches the purchasing division, only then is it assigned to a buyer.

No value is added to the process until the buyer receives the requisition since none of the organizations involved prior to this are Government buyers. The buyer is the person who is going to get the required material on order and

delivered to the customer. Although no formal study was done to determine the length of time a requisition takes to reach the buyer, the sampled requisitions can take up to two weeks to reach the purchasing division (LaGore).

Once the buyer receives the requisition, there is value added to the customer. The buyer's main job is to get the material on order and delivered to the customer. While observing the purchasing personnel at NAWCWPNS it was readily apparent that the process/procedures currently in use are complex and require specialized expertise in the area of purchasing. The buyers can spend a great deal of time searching through various catalogs and publications and on the phone performing research. Without specific knowledge of the customer, a background in purchasing, and knowledge of the APADE system, these functions would be almost impossible (LaGore). The complexity of the process leads to the overall cost of processing a simplified purchase requirement, found to be $174.60 in a China Lake study (Exley, Laura, p.1).

The current process requires customer input throughout. The purchase request has the potential to be returned to the customer four times even before the buyer receives the purchase request. This has the potential to add further delays in the system while feedback is solicited and responded to. This problem stems from the inadequacy of the information initially provided by the customer. The small purchase buyer has the responsibility of translating the customer's requirement into a purchase action. To do this successfully, the buyer must have an understanding of the purchase and the ability to evaluate the adequacy of the requirement's description. This is made more difficult if the customer fails to provide correct and/or sufficiently detailed purchase requests.

The technical customer is the start of the small purchase process and therefore they are the initial screening point to decide the purchase method. The choices include the small purchase methods (Bankcard, SPEDI, traditional

small purchase) and the standard stock requisition. There is the potential to utilize an inappropriate method of procurement. The SPEDI contracts are set up as requirements contracts. Therefore, all material covered by a SPEDI contract should be ordered with that method. There is no control system in place to ensure this happens. SPEDI requires the least amount of time for the customer and purchasing personnel. The customer places an order from their office without the aid of the purchasing divisions. The material is delivered to the location where it is needed.

Completing the purchase request is a manual process. This can lead to errors throughout the simplified purchase process. Lack of legibility in data fields has the potential for the wrong material to be ordered. This results in lost time, productivity and money. A more likely error is the omission of required information. This can result in non-value added time trying to determine the required information. If the customer cannot be easily contacted, then the Stub must be sent back to the customer. Although the NAWCWPNS personnel may make a good effort to correct as much as possible, the BSAT and technical divisions are contractor operated. It is less likely that these services will go beyond the minimum requirements in their contract.

Included in the current process is the requirement for supervisor guidance/approval at various stages of the purchasing cycle. These checks and approvals do not add value to the customer's product. The screening starts when the requisition is received in the purchasing division. The Small Purchase Point of Contact (SPPOC) reviews the purchase request prior to it being forwarded to a buyer. With this requirement, if the SPPOC gets busy, the potential exists to bring the entire process to a stop.

Currently, a hard copy of the contract must be printed out for review after almost every stage in the purchasing division. This adds a significant amount of time and cost to the process. An enormous amount of paper is wasted to verify information is input correctly into APADE. Lost work time is

also an issue since the APADE printer is centrally located in the building of each purchasing division. To retrieve several documents an hour takes considerable effort and time, especially if the desired document does not print. Occasionally, print requests are lost in the network and require a reprint (LaGore).

Another potential bottleneck is the requirement for Small Purchase Lead approval prior to the release of contracts. If the buyers become excessively busy, then that would be magnified for the Small Purchase Lead, who would have up to four times the contract actions to review and release. Currently, only the Small Purchase Leads can release contractual obligations. Therefore, when all buyers are extremely busy, the Small Purchase Lead may be overwhelmed in getting purchase requests processed and released. This delay is of no value to the customer.

As mentioned earlier, the small purchase buyer has many responsibilities that are complicated and diverse. The complex actions done for purchase orders are immense. Buyers must perform a detailed analysis of approximately 12 data fields on the Stub. On a simple requirement for commercial material, this screening is relatively easy. On something more complicated, or unique to the Government, this can be a very exacting process. The complex requirements is where the buyers should be able to concentrate their efforts to achieve the best business deal for NAWCWPNS.

Even if the requirement is not complex, quotes must be obtained. The normal practice involves using commodity books and vendor catalog services. NAWCWPNS is not utilizing EDI except for their SPEDI system. The quotes are obtained by telephone if possible or otherwise by using a Request for Quotation. Even the easier method of oral quotations is very time consuming. If the buyer does not know what the required item is exactly it can be very difficult to establish initial points of contact.

Potential difficulties for the buyers include multiple line items, improper sole source designation, pricing, and price reasonableness. Multiple line item requirements can be a problem because if one of the line items is difficult to work through the process, then the entire requisition is held up. The entire requisition can only move along as fast as the slowest line item, which becomes the critical path. Customers are the primary initiator of sole source requirements. If they incorrectly list something as sole source when it is not, this can lead to incorrect awards not having competition, or slow the process down when another source is discovered. Pricing and price reasonableness are driven by regulation. An award cannot be made unless the price obtained is determined "fair and reasonable" to the Government. This can easily be accomplished with commercial items and a large amount of competition. If few bids are received, or the bids vary widely in price, it is more difficult to document a fair and reasonable price.

E. ORGANIZATIONAL ANALYSIS

The organization of the NAWCWPNS purchasing operation is highly decentralized. Each division is widely dispersed throughout the Naval Air Warfare Station. Since each division is operating in a stand alone method, many positions and functions are duplicated. Having five divisions results in five management positions.

Each division has a Small Purchase Lead, Small Purchase Point of Contact, and Purchase Agents. This organization is very vertical with only an average of three Purchasing Agents per division. This high manager-to-worker ratio is partly attributable to the numerous checks and approvals required in the current process.

The reengineered organization will be a result of the new process. It is imperative that the current organization not drive any reengineered processes. The requirement for a simple process development has enormous consequences

for not only how the processes are designed but how the organization is shaped.

Each purchasing division operates independently of the others with limited coordination with regards to the purchasing system as a whole. This leads to redundancy of efforts and additional management oversight that does not benefit the customer. This type organization can also result in one division being worked to the maximum extent while others are in a less busy phase.

F. AUTOMATED PROCUREMENT AND ACCOUNTING DATA ENTRY (APADE)

APADE was established in the 1980's and has been highly successful in decreasing procurement lead time. However, it is antiquated and very difficult to use. It does not have a multi-tasking capability, or a Graphical User Interface that are now common place in the computer industry. The objectives of APADE listed in Chapter III can all be improved significantly with a new system. The only benefit achieved with the current system is the generation of management reports.

APADE suffers significantly by its lack of user friendliness. Without a great deal of experience with the system it can be impossible to utilize because of the quirks and work arounds that must be used. APADE does not truly offer real-time automated document preparation. The need to continually print out copies of the procurement for review is cumbersome and time consuming. Although APADE was a remarkable improvement when it was established, today's technology makes it possible to do much more.

APADE is an example of applying automation to a manual process. The results are that the process is much quicker due to the speed available on computers, but it is not an optimal process (Short). Simply automating a manual process does not fully utilize the capabilities of an information system. Automated Data Processing equipment is capable of much more than just

automating a manual process. Current technology is capable of producing an Expert System that uses its knowledge about a specific application area to act as a consultant (O'Brien, 1994, p.195). The APADE system is faster than the manual system since several of the manual steps were automated. If a change is needed to a form, it is definitely quicker as it can quickly be changed and reprinted instead of having to be completely retyped. The application of information technology was done incompletely. An improved system could take full advantage of current technology and employee needs.

APADE does not allow true source data automation. Source data automation is the use of automated methods of data entry that attempt to reduce or eliminate many of the activities, people, and data entry media required. The customer is the originator of all small purchase requirements, but the purchase request is not input into SPEDI until it is received at the BSAT. The purchase request has been handled by the customer and the technical division, and been through many stages in the process. One currently available system that could provide this service is the Standard Automated Contracting System (SACONS).

One Commercial-Off-The-Shelf (COTS) available system for automated procurement is SACONS. This is a paperless system from point of entry to point of award that was originally developed for the U.S. Army. SACONS automatically routes the purchase request to the appropriate personnel. For example, if the material is hazardous, it is sent to the hazardous material coordinator for approval. This approval is done in conjunction with other approvals that do not need to be done in sequence.

SACONS has database capabilities with information such as a list of vendors. The vendors list is an excellent tool when it is time to obtain quotes. Potential sources can be obtained on-line without using a myriad of printed publications. Another feature is its on-line FAR and DFARS. The applicable

clauses can be pulled out and repeat clauses automatically placed into contracts by default.

SACONS can be tailored to the user's requirements. For example, at the Naval Postgraduate School (NPS), SACONS captures their bankcard data for inclusion in various purchasing reports (Lane). This has simplified NPS's end of the month reconciliation. If SACONS was installed at NAWCWPNS, it could be tailored to include their SPEDI material.

SACONS can be utilized by all personnel, from customer to purchasing supervisor. Accessing information is provided by user codes. This ranges from information access only to full use and modification. SACONS is user friendly and can be tailored to specific needs.

G. SMALL PROCUREMENT ELECTRONIC DATA INTERCHANGE (SPEDI)

SPEDI is a superb system that has the potential to be a significant part of NAWCWPNS small purchase system. Once the contracts have been set up there is little risk in the actual ordering of material. Normally receipt happens within one day. It appears that SPEDI is beneficial to the Government and the supplier. Orders can be placed at any time of day or night adding flexibility to the customer since the store never closes. The supplier can download data whenever wanted and process orders.

Technically a SPEDI contract is not a small purchase. Although the requirements contracts can be very large, they replace what would be countless small purchases for the material. This saves time and money for NAWCWPNS and potential suppliers. Once the contract is established it reduces overhead, frees up contracting personnel and eliminates additional contract actions. Contract administration of a SPEDI contract is simplified due to the electronic basis in which it operates. Suppliers benefit from limiting the number of requests for proposals they must prepare. This allows the efficient use of their resources.

One potential problem is the use of requirements contracts. A requirements contract legally commits NAWCWPNS to obtain the covered material from the designated supplier. The customer is responsible for the initial SPEDI application screening. If a SPEDI contractor is not used for a covered item, there is the potential for claims against the Government and litigation. The possibility for lawsuits makes it imperative that all items that fall under SPEDI requirements contracts are ordered through this method.

The basic SPEDI concept is excellent. The ability for customers to order material directly from their offices in an on-line fashion is ideal for the situation at China Lake. The SPEDI system itself could be more user friendly. Even though the potential exists for on-line item identification and ordering, it is not performed in this fashion. Most customers use a printed catalog to identify material prior to entering the SPEDI system to order.

SPEDI costs are not as low as they could be. In a 1992-1993 study at NAWCWPNS, a high portion of costs comes from fixed costs, such as management labor and computer support (Exley, Laura, p.4). SPEDI costs approximately 97 dollars per order with 70 percent coming from fixed costs. The cost per order in a SPEDI order is also the cost per line item since only one line item can be processed per order. The high fixed cost portion of the overall figure shows the potential to reduce the per order cost if SPEDI was expanded to include additional items.

H. NAWCWPNS BANKCARD PROGRAM

The bankcard is another innovative approach enabling NAWCWPNS to achieve greater customer service with less resources. Bankcard purchases have established a firm position in the overall small purchase process. They provide superior customer satisfaction and have the lowest cost of processing of any of NAWCWPNS's purchasing methods.

The major potential problem with bankcards is unauthorized purchases. Without proper training and enforcement of rules, this potential problem could become a serious flaw in the system. Another problem is the possibility of making purchases without adequate available funds.

Advantages include the simplicity of the process. Essentially, the customer becomes the buying agent who makes purchases much like an individual would do for personal items. The process in obtaining the required material is compressed significantly. All non-value added events have been eliminated. This results in a dramatic reduction of paperwork and the rapid receipt of material.

I. SUMMARY

This chapter identified various benefits and inefficiencies attributed to the objective of NAWCWPNS small purchase process. The three primary vehicles are bankcard, SPEDI, and traditional simplified purchase procedures. These three methods are integral to the overall success of NAWCWPNS small purchase system. Each has its benefits and drawbacks. However, each method has a definite purpose in the NAWCWPNS organization.

V. CONCLUSIONS AND RECOMMENDATIONS

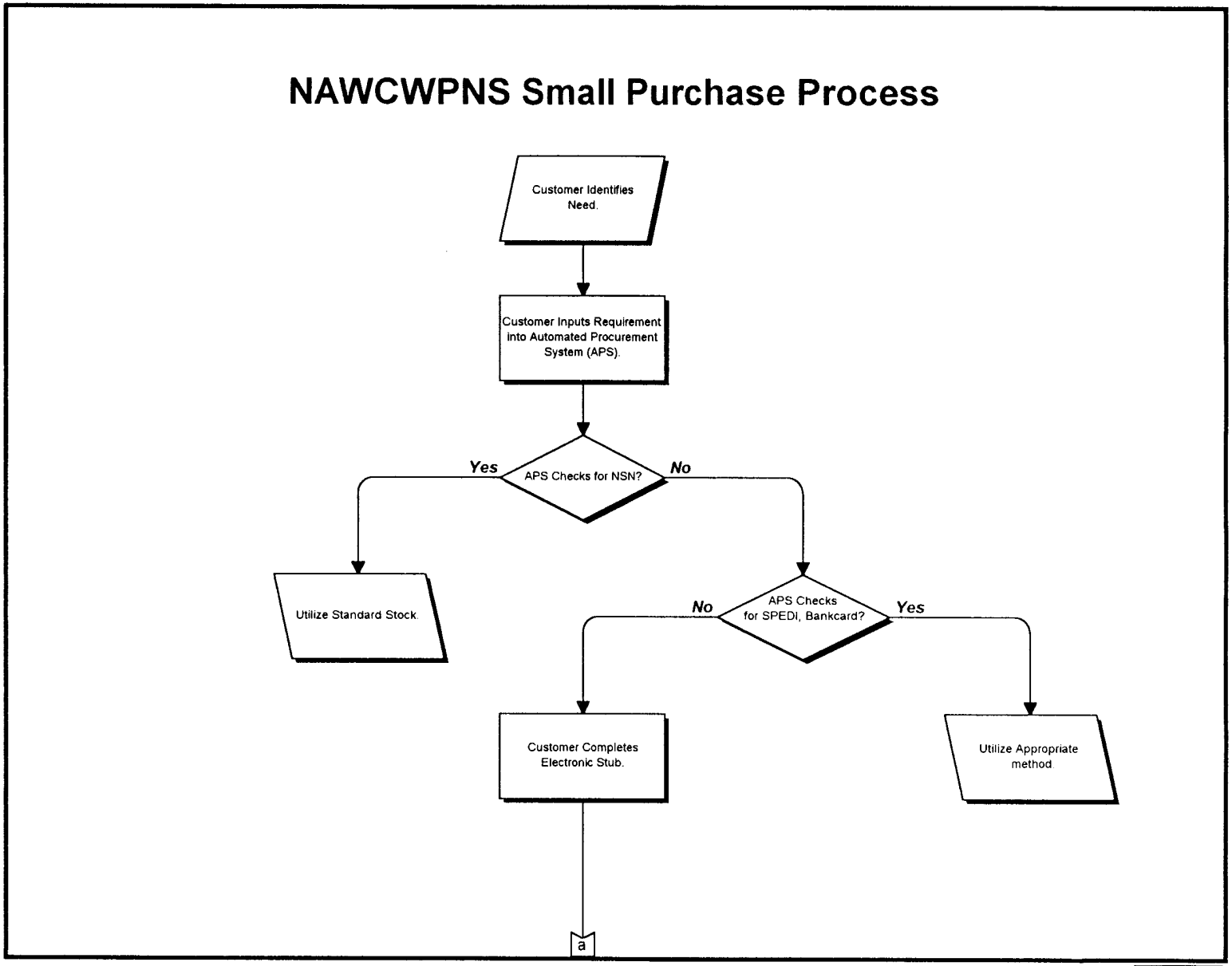
A. INTRODUCTION

Reengineering is not a cure-all for an organization, but offers constructive methods to obtain "radical" improvements when businesses find themselves in need of improvements or desire to remain as efficient as possible. Radical changes are needed in a dynamic business environment where one is required to accomplish more with less. While applying Business Process Reengineering (BPR) principles to the Naval Air Warfare Center Weapons Division (NAWCWPNS) small purchase process, several inefficiencies were discovered. It also became evident that if the recommendations discussed in this chapter were implemented, significant improvement could be realized. The basis for the recommendations made in this chapter is the desire to reduce overall cycle time and improve customer service.

B. PROCESS RECOMMENDATIONS

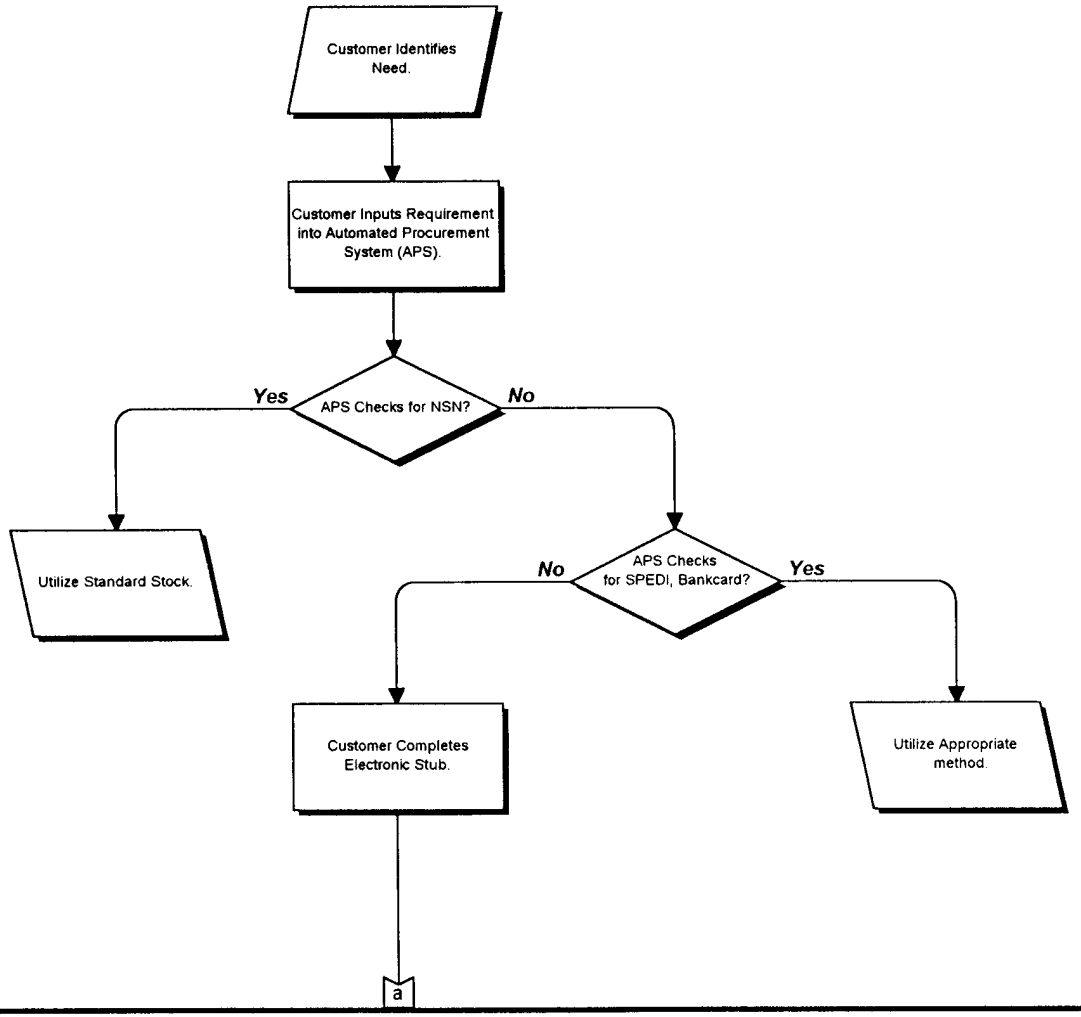
The objectives of these process recommendations are to reduce overall cycle time and therefore provide better customer service and reduce costs. The length of time currently required to process a customer's requirement can be significantly reduced. The potential improvements in the revised process are shown in Figure 5-1. First, the feasibility of eliminating the technical division and Boeing Support Automation Team functions should be examined. Although these functions are important, they are very time consuming in the process. These steps could easily be accomplished concurrently with other portions of the process by purchasing personnel or the customer. As a minimum, with electronic purchase requests, requirements could be transmitted to BSAT and the technical division concurrently.

Figure 5-1

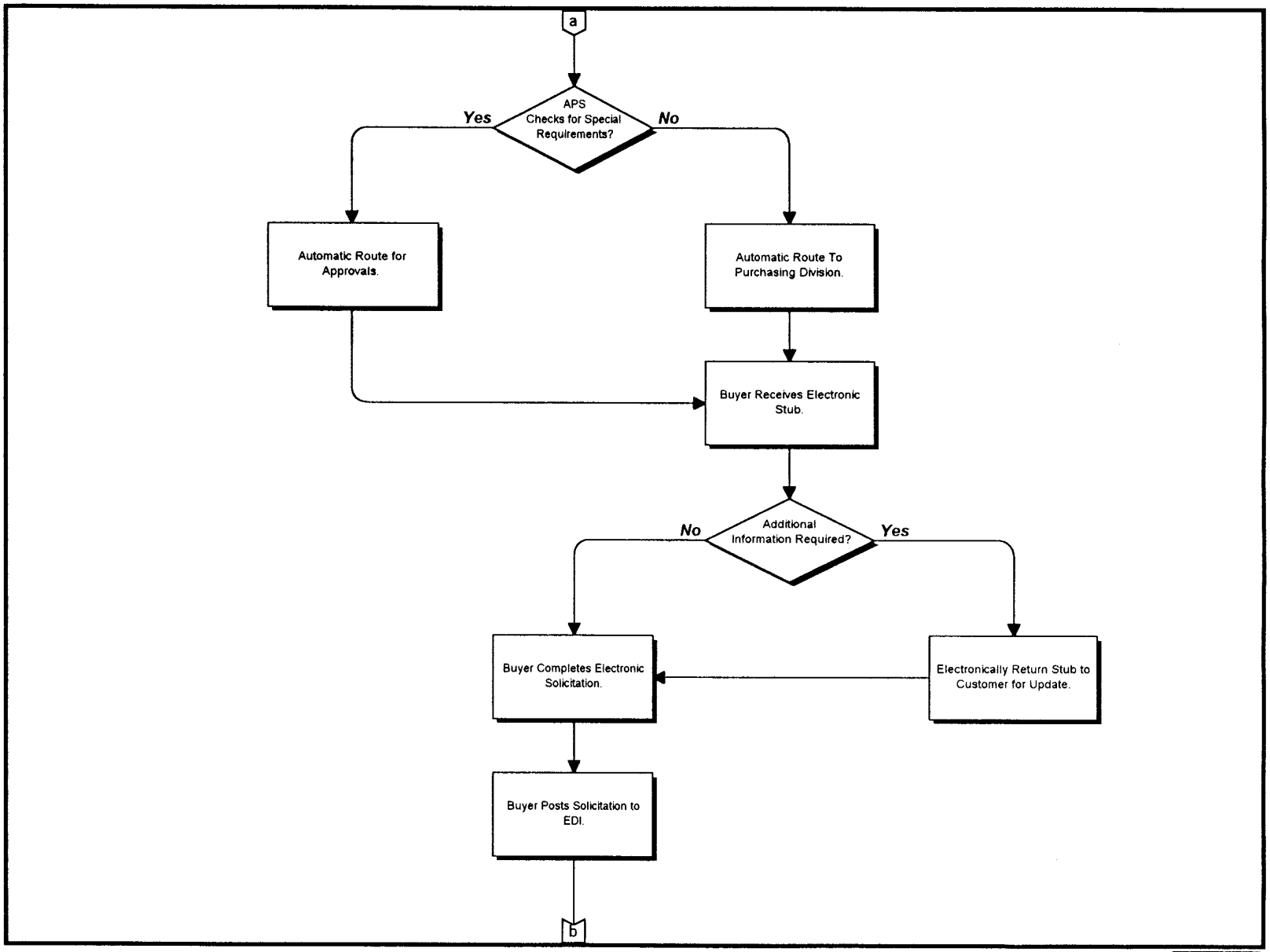


Source: Developed by Author

NAWCWPNS Small Purchase Process



page 1 of 3


a
APS Checks for Special Requirements?
Yes
No
Automatic Route for Approvals.
Automatic Route To Purchasing Division.
Buyer Receives Electronic Stub.
Additional Information Required?
No
Yes
Buyer Completes Electronic Solicitation.
Electronically Return Stub to Customer for Update.
Buyer Posts Solicitation to EDI.
b

If on line technical information was available, the customers could begin the initial screening for National Stock Numbers easily. Having the customer perform this initial screen accurately would save time since no lost effort would be put into trying to utilize the purchasing system when it is not needed. Customers would learn up front what material was available through the various purchasing methods. Also, by incorporating SPEDI into this integrated system, the customer could save the greatest amount of time since SPEDI requirements are filled quickly without having to leave one's workcenter.

An additional benefit to electronic purchasing is the reduction in the number of times the purchase request changes hands in the process. As shown in Figure 3-1, there are numerous occurrences when customer input may be required. The electronic capability allows simultaneous reviews and quicker response. The only natural process flow is from the customer, to the purchasing agent, to the vendor. Any other part of the process is either duplicative, non-value-added, and should be streamlined or eliminated.

In the new electronic process, BSAT functions would be performed by the customer automatically without any additional effort. The new purchasing system described above involves true automation from the beginning of the process. The BSAT functions take place automatically when the order is placed because the customer now enters their requirement on-line instead of on paper. The purchase request is entered when the customer completes the electronic "Stub". This saves time from having to input data again and the potential for errors is dramatically reduced.

An electronic purchasing system would facilitate the reduction in the total number of steps required for the small purchase process. For this to occur, as many steps as possible need to be consolidated and moved to the lowest level possible. This could be accomplished through on-line help, a Decision Support System, or an Expert System. These additions can answer

many of the routine questions or problems that consume the purchasing specialist's time.

C. SYSTEM RECOMMENDATIONS

NAWCWPNS needs an integrated electronic purchasing system. This system would network the entire weapons station with the purchasing division and expand EDI use with vendors. The APADE system has outlived its usefulness and needs to be replaced.

The new purchasing system would link the terminals of all users of the new process. This would allow electronic communication and transmission of purchasing documents. The most important link is the connection of the technical customer with the purchasing division. These are the two key players in the process. The customers would require a terminal for each ordering site. The number of network computer terminals would be one per person in the purchasing divisions. Most of these terminals are already in existence, so new hardware procurements would be minimal.

This new system would allow true source data automation of the requisition process, a serious deficiency with the current process and APADE. Since the originator of all requirements is the customer, this is where the ordering process should be automated. Each customer's terminal would have a skeletonized on-line purchase request with all standard information filled in. This will save time and errors in requisition preparation. The customer user screen could be tailored to display just the fields they need to complete. These data fields would then be transmitted electronically through the process. Instructions on needed information should be available next to the data fields or via on-line help.

The automatic checking of fund availability of SPEDI should also be incorporated into the system. The total obligation for each purchase order could easily be compared to the customer's available obligation balance. This

would save time and prevent over-obligation of funds. Ideally, once the purchase order is released, it would automatically obligate the customer's funds. To accomplish this, the new purchasing system would need to be linked to the financial management database.

This new system would be fully integrated with all purchasing methods, allowing one stop ordering for the customer. The customer could input the description of the material they desire; SPEDI and NSN material would be checked automatically. SPEDI has the potential to fill many more requirements than is currently being accomplished and is specifically discussed in section F of this chapter. If the purchasing system were totally integrated, it would minimize the ordering processes that require highly knowledgeable personnel to accomplish.

There should be an easy SPEDI computer check requirement prior to utilizing the bankcard method. This results in the addition of a function being implemented that does not benefit the customer, but the consequences of not using SPEDI when it is required make this cost effective. Specific SPEDI recommendations that would preclude the need for this step are in section F of this chapter. As mentioned above this should be integrated into the single electronic purchase system. If the contract method for SPEDI was changed from a requirements contract to another type such as indefinite delivery, indefinite quantity, this SPEDI check could be eliminated. Chapter IV discusses the legal ramifications of not utilizing a requirements contract when it is established.

Having an electronic purchase system will help compress the overall time it takes to process a requisition as well as speed transmittal times. The customer will no longer have to walk requirements from office to office to ensure processing at the various stops. The foundation for this system is already in place with NAWCWPNS's network system. Therefore only software developments would be required.

Electronic processing allows processes to follow only the required path. This is achieved through simultaneous performance of steps that do not logically need to follow each other. For example, the current BSAT and technical division evaluations could be performed at the same time. This cuts in half the number of steps before a purchase order reaches the purchasing division. In a paper-driven process, this is impossible since only one organization can review the documents at any one time.

Using an electronic purchasing system from point of entry to point of receipt, facilitates the measurement of quality from the customer's perspective. The generation of process reports that include total cycle time data as well as individual portions of the process allows continued improvement once the new system is in place.

D. ELECTRONIC DATA INTERCHANGE (EDI)

The implementation of the new system for NAWC should include an expanded use of EDI. SPEDI is just the beginning of what is possible with EDI. Expanded use will become mandatory in the future. The direct benefit of utilizing EDI is the reduction of paper handling, such as:

- Reduced data entry time and labor.
- Improved data accuracy.
- Reduced mailing costs and paper handling.
- Reduced document storage.

The above direct benefits may also carry other intangible benefits. If EDI can be fully implemented, it could reduce inventory requirements, transportation costs, and improve cash flow. The overall value should be increased customer service and a reduction in the time it takes to receive material.

E. SMALL PURCHASING DIVISIONS

Consolidation of simplified personnel into fewer sites will reduce the amount of management oversight required. The goal should be one consolidated purchasing site. There are two or three purchasing agents managed by a small purchase lead or a Small Purchase Point of Contact in each division. These small groups are inefficient; having neither a sufficient number of personnel to handle the workload, nor an optimal number of personnel for management span of control. Consolidation would enable the most efficient utilization for the reduced number of simplified purchase actions. This should not reduce customer support since the purchasing system is done via electronic means and communication can be done by e-mail.

If the divisions are centralized, maximum efficiency could be achieved. It may be possible to assign buyers by commodities, thus building expertise. This form of organization helps establish the base for a market research program.

If orders for the same type of material were received, they could be consolidated. This would result in less overall work and the possibility of obtaining quantity discounts.

F. SIMPLIFIED PURCHASE BY EDI

The SPEDI program has been a huge success achieving its goals. As stated in Chapter IV, it has succeeded in streamlining the time it takes a customer to receive material. SPEDI use should be maximized, especially until other forms of EDI come into use. Currently, SPEDI is the only small purchase avenue that provides easy ordering and quick delivery without having to leave one's workcenter.

Expanded use of SPEDI will reduce the cost per order. The highest percentage of fixed costs per order is found with the SPEDI purchasing method. SPEDI is currently operating with 70 percent fixed costs. If more contracts

were established with SPEDI then better quantity discounts could be achieved. Having common material available almost as soon as it is needed should greatly reduce, if not eliminate any need for warehoused material. This would save in storage costs, damaged material, and obsolete material.

The major problem with SPEDI is the requirements contracts. This could result in additional costs from lawyers fees and payments to vendors. All future and renegotiated SPEDI contracts should be established as Indefinite Delivery, Indefinite Quantity (IDIQ), or similar type contracts. This saves the cost of any repercussions due to inadvertently obtaining SPEDI material through another contracting method.

If SPEDI were incorporated into the overall electronic purchasing system, its entire report system could be maintained. One set of key tracking reports are the various contractor performance reports available. The maintenance of these reports can enhance best value contracting if used for the basis of past performance.

There are several changes needed to improve the current SPEDI system. First, the search capability should be enhanced. Easier on-line searching would eliminate the printed catalog requirement. Improved item descriptions would also enhance use by customers. A detailed description with on-line photos should ensure that the desired material is what is ordered. SPEDI has a definite future at NAWCWPNS and possibly externally to NAWCWPNS. Increased selection and use will bring down costs and increase customer service.

G. BANKCARD

The NAWCWPNS bankcard program has greatly improved response times from procurement initiation through receipt. This is possible since the customer makes the purchase when he wants. The use of bankcards has been implemented smoothly at China Lake and continued use is highly recommended.

The bankcard process should be integrated with the entire electronic purchasing system recommended in section B of this chapter. Having an integrated system for all procurement methods facilitates the learning process to acquire material. This benefits the customer as well as purchasing personnel. More importantly, having Bankcard purchases managed through the automated purchasing system simplifies the accumulation of procurement data. This enables the ad hoc preparation of management reports and comparison of procurement data without having to consolidate information databases.

H. SUMMARY

The China Lake site of the Naval Air Warfare Center Weapons Division (NAWCWPNS) was established to support the research, development, test, and evaluation requirements of Navy weapons systems. The small purchase staff of the Contracts Competency Division is extremely capable and willing to perform superbly. If a new purchasing system were acquired that would facilitate streamlining and simplifying the purchasing process, the NAWCWPNS mission could be supported more efficiently. There are Commercial-Off-The-Shelf available systems that could fill this need.

I. AREAS FOR FURTHER RESEARCH

Business Process Reengineering can be applied to a myriad of projects and applications. Areas where BPR can be utilized is only limited by the imagination of the organization. BPR should not be limited to small purchasing or purchasing in general.

An area for further research directly related to this thesis would be to follow up on NAWCWPNS BPR efforts. Specifically, a study could be done in the area of material receipt cycle time. Additional BPR projects could be applied to the bankcard and SPEDI purchasing processes.

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